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The public interest in mining is more general now than it has been for years past, and the amount of money which is going into mining enterprises is very large. One indication of this is the number of letters which we are receiving which contain inquiries about different mines and companies and ask for advice as to purchases of stocks or shares in claims and mining ventures of all sorts. Not a day passes without the receipt of such letters, and their number becomes embarrassing. We find it necessary, therefore, to repeat what we have often said before, that we cannot possibly undertake to give advice or opinions on the future of special mines and prospects. We publish in our news columns all attainable information about new enterprises; and we have never hesitated—as our readers know—to call attention to schemes which we believed to be unworthy of confidence. Our subscribers will find in most cases the information from which they can form an opinion as to the probable value of an investment, and base their decision. We cannot undertake to go further and give direct advice or undertake examinations of properties or processes which should be properly referred to a mining engineer or metallurgist.

While on this subject, we find it necessary, also, to repeat the notice—which some of our correspondents seem to forget—that we do not notice anonymous communications. Letters of inquiry must be accompanied by the names and addresses of the senders; though these will not be published unless they direct it.

The consumption of copper in Germany showed very little increase last year, although it grew very rapidly during the five years 1894-1898, inclusive. The total supplies for consumption last year, according to the figures collected by Messrs. Aron Hirsch & Son of Halberstadt, were 102,618 metric tons, which compares with 101,519 tons in 1898. Five years previously, in 1894, the total was 62,955 tons. Only a small part of the supply is produced in Germany, the total home output being 37,676 tons; and of this it is estimated that 4,500 tons were from imported ores, chiefly pyrites brought in for their sulphur as well as their copper value. The total imports into Germany for 1899 were 89,746 tons, and the exports 20,304 tons, leaving net imports of 69,442 tons. From this, however, must be deducted the 4,500 tons imported in ores and included in German production, which would reduce the net imports to 64,942 tons. This, added to the production, gives the total supply of 102,618 tons, as already noted. The stocks held in Germany at the close of the year were very low, so that probably all the supplies entered into consumption.

The copper imported as raw material was not all retained in Germany, however. The exports of copper in various manufactured forms amounted to 40,175 tons, while the imports were only 2,811 tons, so that the German manufacturers sent abroad 37,364 tons more than they received. Thus over 35 per cent. of the copper supplies last year were put into manufactured form in Germany and sold abroad.

The results of the higher price of copper during 1899 are shown in the report of the Rio Tinto Company—the largest European producer—for that year. With a very moderate increase in production so large a gain in profits was made that the company was able to pay 80 per cent. dividends on its common stock, against 40 per cent. in 1898. As one-half the capital is in preferred stock, which receives 5 per cent. only, the average return on the entire amount—which is £3,250,000—was 42½ per cent. in 1899, and 22½ per cent. in 1898. The company continues to exploit its great deposits of pyritic ores successfully, and the yield shows no sign of diminishing, notwithstanding the centuries during which the mine has been operated. The company last year treated about 40 per cent. of the ore taken out at the mines, while 60 per cent. was sold for its copper and sulphur values, and exported from Spain. The average copper content of the ore taken out last year was 2.72 per cent., a decrease of 0.13 per cent. from 1898; but the changes in this respect have been slight for a number of years past.

As with all the copper companies, Rio Tinto shares are now at a very high point. They sold in London last week at £60 per share of £5 par value. At this rate last year's dividends amounted to only about 6 2/3 per cent. on the selling price. From present appearances the dividend for 1900 is likely to be quite as large as for 1899, but the price seems high. Rio Tinto, however, is a prominent stock on the European exchanges, and there has been a very strong speculation in the shares this year.

An unusual recent feature of the Connellsville coke business is the erection of a tipple for the shipment of raw coal at the Lemont plant of the H. C. Frick Coke Company. It has never been the policy of the coke companies to ship Connellsville coal, because the profits are so much greater in the manufacture and sale of the coke. In fact so pronounced is the difference that it has been customary at times for the coke companies to burn coal shipped in from other regions rather than

to burn coking coal dumped in the tipple bins and not a foot away from the boilers. But the coal has been mined out from some of the mines which formerly supplied many ovens that were allowed to fall into disuse during the dull times a couple of years ago. The activity in the coke fields has made it profitable to fire up these abandoned plants, and as there is no coal to be had immediately in connection with the blocks of ovens it is necessary to haul it from some mines where the working face of the pit is large enough to supply more than is needed for the coke ovens there. The shipment of coal in the region, therefore, is a local shipment, and does not mean that the coke companies are entering the coal market. For instance, the West Overton ovens, near Scottdale, have no coal track attached, nor has the string of ovens formerly operated in connection with the Uniondale Plant at Dunbar, and now fired with coal from the Cambria Steel Company's Atlas plant. Other ovens are supplied up in the same way. The Morrell Plant of the Cambria Steel Company itself burned coal brought from other places. This coal is dumped into a hole in the ground from the railroad cars, caught in the mine wagons below, hauled to the surface and dumped again into the bin and later charged from the oven lorry; quite an extended operation, but much more simple after all than it appears from the description.

GAS AND GAS ENGINES.

We have frequently in the columns of the "Engineering and Mining Journal" expressed the opinion that great economies in the distribution and utilization of fuel could be, and would be in the near future, secured by the conversion of coal into gas at the mines or at other convenient distributing points, and its transmission in that form to cities and other points where it is needed. The saving in transportation, and the economy secured by the use of coal in the gas-producers as it comes from the mine, without the necessity of preparation for market and the consequent waste, have been pointed out so often that it is hardly necessary to repeat the argument here. The transmission of gas can be effected over long distances with very much less loss than in the transmission of electricity; while it is possible to store up gas in large quantities and to hold it until it is needed in a way which cannot yet be done with electricity. Gas can be applied in several ways; it can, if preferred, be used as fuel for making steam, although its direct conversion into power through the medium of the gas engine is much more economical. For domestic uses in cities and towns it is more economical and far more convenient than coal, as thousands of people in New York and elsewhere are finding out yearly.

Our views on this point are supported by so high an authority as Mr. George Westinghouse, who says in the introduction to a pamphlet recently issued—"A New Industrial Situation":

> "Long familiarity with the electrical industry, the pipe-line transportation of natural gas in great quantities, and an active interest in the development of large gas engines, satisfy me that the economies which will result from the distribution of power by means of gas generated at central points, and conveyed in pipes along the lines of railway, for the operation of engines and electric generators, will be sufficient to justify the expenditure of the capital necessary for such installations in connection with the electrical equipment of railways, particularly metropolitan and suburban lines. . . .
>
> "The advantages of the use of gas engines can be best appreciated when it is understood that if a gas company were to supplant the present gas illumination by an equal amount of electric light, obtained from gas-driven dynamos, it would have left for sale, for other purposes, over 60 per cent. of its present gas output."

Mr. Westinghouse has already proved his faith in these statements by taking up the manufacture of gas engines on a large scale, though this required a heavy outlay, and he had a large established business in the construction of steam engines. The remarks quoted refer most directly to electric railroad work, but they are equally adaptable to other uses of power.

There can be no doubt that the movement toward the substitution of gas from coal for the raw coal has already begun, and that it will make rapid progress seems very probable. We noted in our columns not long ago the adoption of gas engines run by producer gas in the new shops of the Erie Railroad in Jersey City, with a remarkable resulting economy. We believe that this economy would have been much greater had the company been able, in conjunction with other large consumers, to put the gas producers at the mines, and to send forward the gas, instead of hauling the coal to its shops. The expenditure for the construction of a pipe line would not be warranted by the needs of a single establishment, but it will not be long before there are enough others to justify such a line, if the proper measures are taken.

The general use of gas as fuel will doubtless result in a great extension of the use of gas engines. It is not very long since we were in the habit of looking on gas engines as suitable only for small power; but the change has been a rapid one, and now there are many such engines in successful operation ranging all the way from 100 up to 650 horse-power, while at least one large power plant is under construction, the units of which will be gas engines of 1,500 horse-power each.

What the saving is in the use of the gas engine can readily be shown. In the case of the Erie shops above mentioned the consumption of coal in the producers which supply the gas engines is only 1.1 pound per horse-power hour. In a large electric plant in Western Pennsylvania, in which natural gas was burned to generate steam for engines aggregating 575 horse-power, the consumption of gas was 52 cubic feet per horse-power hour. When the steam engines and boilers were taken out, and gas engines of equal capacity substituted, the consumption of gas was reduced to 13 cubic feet per horse-power hour. Such instances could be multiplied from experience.

In electric work especially the gas engine has now proved not only its capacity, its greater economy in first cost and in operation, but also its ability to work successfully under frequent and sudden changes of load, a point about which many engineers were doubtful. Its safety and comparative ease in management were already conceded.

The question of supplying a large city with manufactured gas for fuel and power purposes is no longer in the stage of discussion; the work has been begun. The New England Gas and Coke Company's large works near Boston are now in operation, and President Henry M. Whitney recently announced to a committee of the Massachusetts Legislature that his company is supplying the old gas companies of Boston and the neighboring towns with illuminating gas at a price of 30 cents per 1,000 feet, and is prepared to furnish gas for fuel and power purposes at 20 cents per 1,000 feet. This plan of working through the existing companies has been chosen in order to avoid franchise complications, to utilize the distributing facilities already completed, and to avoid the difficulties attendant upon the putting down an entirely new system of pipes.

The Boston company uses coal not of the best quality, and is able to make low prices because all the coal is utilized. Its plant is composed of by-product coke ovens, and in it the tar, ammonia sulphate and other by-products of the coal are saved; the coke is sold for metallurgical fuel and for steam raising in locomotives and factories; the gas is sent through pipe lines to the points where it is distributed to local consumers. Thus far the chief use for it is illumination, but there is no doubt that the Boston people will soon learn the advantages of using gas for heating and power, and that the consumption for those purposes will increase very rapidly.

To go a little further, the economy of using the gas for power directly in gas engines instead of consuming as fuel in making steam will speedily be realized, and the very general substitution of gas engines for steam engines will speedily follow.

What has been successfully begun in Boston can and will be imitated in New York, Philadelphia, Chicago and other large cities. We believe that the next few years will see the establishment of large plants in or near many of our cities very similar in character to that at Boston. The comparative ease with which gas can be conveyed through pipe lines, with a very moderate proportion of loss, will lead to the location of these plants, if not at the mines themselves, at points to which coal can be easily and cheaply transported, and where the by-products can be conveniently handled.

The companies now concerned in mining and carrying coal will do well to recognize these facts. By doing so promptly and taking the lead in the new movement they will place themselves in a far better position than they are likely to hold if they expend their energies in fighting changes which are inevitable. Their opposition may cause delay, but is sure to be unavailing in the end; and an obstructive course will only result in disaster to themselves. This is especially the case with the anthracite companies, which may find their product very largely supplanted by the cheaper bituminous coal for gas producing purposes. If they take up at once the question of utilizing a large part of their output in the form of gas they will find it much more to their ultimate advantage than squabbling over prices and building, or trying to hinder the building of, new railroads.

Industrial changes in our day proceed very rapidly when they once begin. It may seem extravagant now to talk of superseding the steam engine, but changes almost as great have occurred during the past ten years, and it is not safe to say that still greater ones will be brought about during the next ten; and enough has been done already to warrant the belief that this will be among them. We do not mean to say that the steam engine will disappear; it will still have an important part in our industrial system. It will, however, have to yield the first position to the gas or impulse engine converting fuel into power without the intervention of the boiler. The signs of the coming change are already apparent, and are becoming daily more visible.

NEW PUBLICATIONS.

"Notes on Lead and Copper Smelting and Copper Converting." By Hiram W. Hixon. Third Edition, with additional appendix. Pages, 128; illustrated. Price, $3.

Mr. Hixon's book was fully and carefully reviewed in the "Engineering and Mining Journal," September 11th, 1897, shortly after its first appearance. During the two years and a half in which it has been before the public the demand for the volume has fully proved its usefulness, and shown that it is accepted by those for whom it is written as a standard work on the subject. It now appears in a third edition, carefully revised and with the addition of an appendix treating on Changes and Improvements in Lead Smelting. This contains notes on mechanical roasting furnaces; utilizing waste heat; the effects of coke in smelting; the liquation of buillion drosses; automatic charging apparatus; bosh water jackets; seeling pots; methods of saving flue-dust; briquetting flue-dust; briquetting sulphides, and determination of flue-dust losses. These notes are an excellent addition to the book and increase its usefulness to smelters. C. T.

"The Gas Engine Hand-book." By E. W. Roberts. Cincinnati, Ohio: The Gas Engine Publishing Company. Pages, 220; illustrated. Price, $1.

There is a scarcity of practical literature on the gas engine. The internal combustion engine has been treated theoretically by several writers, especially in France, but very little has been written or published on the more practical side. The manufacturers of gas engines seem inclined to keep to themselves all the information they have acquired through experience, presumably fearing that their rivals may take advantage of it—a narrow-minded policy which hurts more than it helps them in the long run. This little book is, therefore, a timely and useful one. The author has collected and condensed in it a large amount of information about the design, construction and operation of gas engines which will be of much service to those who use these engines, as well as to those who want to understand the principles which govern their working. He modestly disclaims the intention of writing a complete treatise, but has made his book as nearly thorough as could be expected in a limited space. It is the only practical book of the kind at present attainable and can be recommended to all who are interested in the subject.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

"Notes on Paraguay." Edited by Enrique Plate. Buenos Ayres; A. Lennox Samson. Pamphlet; pages, 36.

"Conversion Tables of Weights and Measures and Foreign Money." Philadelphia; The Philadelphia Commercial Museum. Pamphlet, pages 32.

"The Calculations of Analytical Chemistry." By Edmund H. Miller. New York: the Macmillan Company, and London: Macmillan & Company, Limited. Pages, 184. Price, $1.50.

"Report of the Governor of Arizona to the Secretary of the Interior." N. O. Murphy, Governor. Washington; Government Printing Office. Pages, 256. With map and illustrations.

Geological Survey of Canada. "Preliminary Report on the Klondike Gold-fields, Yukon District." By R. G. McConnell. Ottawa, Canada; Government Printer. Pages, 44; with map and illustrations.

"The Technic of Mechanical Drafting; A Practical Guide to Neat, Correct and Legible Drawing." By Charles W. Reinhardt. New York; the "Engineering News" Publishing Company. Pages, 36; with illustrations and plates. Price, $1.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Quotations of Lake Copper.

Sir:—I notice for the last few weeks you have been quoting Lake copper below 17c., and knowing that you are always desirous of having the quotations of the "Engineering and Mining Journal" altogether accurate, I call your attention to this; for it is not in accordance with the actual conditions of the market. It has been easy during the last two weeks to sell Lake copper at 17c. and even a fraction above that. I therefore hope you will have this quotation corrected in your next issue, for it is not doing justice to the interests of the Lake producers.

New York, April 22, 1900. I. R. S.

Utilizing the Heat of Molten Slag.

Sir:—Mr. Bretherton, by his invention for utilizing the heat of molten slag for raising the temperature of the air for blast furnaces, as described in the "Journal" for November 18th and subsequently, appears to have satisfactorily solved the problem of recovering the heat lost by radiation from the forehearth and its contents during the smelting operation. The apparatus is ingenious and no doubt of considerable efficiency; but has not the inventor, with the natural enthusiasm of his class, over-estimated the advantages which accrue from its use in claiming to heat the blast to a temperature so high as 500° or 600° F.? Surely there must be an error somewhere.

Considering Mr. Bretherton's invention, we are led naturally to the wider subject of the utilization of the heat of furnace slags in general, a problem to which a great deal of time and thought has been devoted in late years. Several inventions of more or less merit dealing with the matters have been placed before the public, and perhaps, it will be worth while to consider briefly a few of the things that have been attempted, and ask what is likely or possible to be achieved henceforth in this direction. But first, in order to refresh the minds of those who are not entirely en rapport with the subject, it will, perhaps, be useful to go into some simple calculations to show how much heat there actually is in melted slag, as nearly as the present imperfect condition of metallurgic science will allow.

It will be remembered by all, no doubt, that the specific heat of blast furnace slags has been found to vary according to their chemical composition, their temperature, and possibly also according to their crystallographic habitus. It has been ascertained, for example, that while the specific heat at ordinary temperatures may be no more than .19, at higher heats it rises progressively to a maximum in the case of ordinary slags, of fully .25 at the melting temperature. Many metallurgists in fact assume .25 as the specific heat of slags when in a molten condition, an assumption that accords well with whatever evidence has been thus far deduced, and that we may safely make in this examination, in which the question of specific heat plays an all-important part.

Next comes the matter of the latent heat of fusion slags, on which our ideas are still less exact. Experiments on cinder from iron furnaces gave one investigator 120 calories as the latent heat of certain basic slags high in lime; while cupola slags high in iron gave much lower results, averaging, perhaps, 100 calories for this class of slags, which are, perhaps, more fairly representative of those produced in furnaces like those at Silver City, with which we have at the present chiefly to deal. Assuming the issuing temperature of the slag at 1,300° C.; its specific heat as .25; and its latent heat of fusion as 100 calories; it appears that the whole heat taken up by a unit weight of the slag in the furnace would be some 425 calories under the conditions. This assumption conforms sufficiently well with the investigations and estimates made by Bell, Gruner, Rinmann and other iron metallurgists, to whom, by the way, we owe the most that is known on the subject. Their conclusions form, I think, a sufficiently exact basis for our present purpose, which is not severely critical at all. Notice that Bell found 550 calories as the total of heat, sensible and latent, contained in lime and alumina singulo-silicates, those slags which, so far as is known, have the greatest capacity for heat; and others have reported 500, 430 and 400 for other slags, the lowest of which correspond somewhat closely to ordinary lead and copper slags. This involves the question of the issuing temperature of slags, a question on which every metallurgist and furnaceman is entitled to have his own opinion, but which I have concluded must be in the vicinity of 2,300° F., which is close to 1,300° C., as cited.

Comparing the quantity of heat, 425 calories, contained in one unit weight of slag at the issuing temperature, with that produced by or necessary to given chemical or metallurgical operations, with that produced by or necessary to given chemical or metallurgical operations, it is about equal to that set free by completely burning one-eighteenth as much carbon; and about one-fifteenth as much would be produced by thoroughly burning an equal weight of good bituminous coal. This is nearly equivalent to saying that could all the heat produced by burning one ton of carbon (we may even say coke) be conserved and properly applied, it would melt about 18 tons of cold slag; and that one ton of good bituminous coal would melt 15 tons of cold slag, under the previously suggested conditions. And now comes the question, vital to this inquiry, How much air will a given weight of hot slag heat?

The specific heat of air at constant pressure being .2375, it is easy to see that the unit weight of melted slag at 1,300° C. would heat an equal weight of air to 1,789° C., could all of its 425 calories be transferred to the air. This is good and encouraging as far as it goes, for could we get a blast of this temperature it would be all that we could desire. There would then be no need of fuel to burn inside the matting furnace. But when actually applied to heating the blast we meet with the obstacles that the weight of the air to be heated far exceeds that of the slag produced, and that the percentage efficiency of any possible heat-transferring device is unsatisfactorily low, so low in fact that we only realize a comparatively small proportion of the heat actually contained in the slag, and having thus no margin to go upon even when utilizing all that we possibly can, we begin to realize the mistake into which people oftentimes fall in regarding as unlimited the quantity of heat which goes away in the waste slags. The apparatus, for example, with which I heated the blast at the Keswick Works, heretofore spoken of in these columns, was designed to impart all the heat of the slag, sensible and latent, to the blast; but it did no more than raise the temperature of the air to 580° F., or rather more than 500° above the atmosphere. This reflection leads to the query with which I began this letter, namely, as to whether Mr. Bretherton is not mistaken regarding the blast temperature which his apparatus attains. It will be remembered that he makes no provision for cooling the slag in contact with the air blast, but lets the radiated heat from the forehearth containing molten slag warm up confined air which in turn passes on its heat through the sides of iron pipes to the blast. One would not suppose that there would be under any imaginable circumstances such a fall in temperature of the slag, as it merely passes through the forehearth, as is to be inferred from the inventor's claims. Indeed, I doubt if the forehearth could be run at all if the loss of heat from it was so great. I do not imagine that the difference in temperature between the incoming and the outgoing slag would be in any case more than 300° F., which would imply, for example, 2,300° when it leaves the furnace and 2,000° when it leaves the forehearth. Should it get much cooler while in the forehearth it would tend to chill it up and contract the space progressively until it had to be abandoned. But this again is a question for future solution. I can only say that, judging by the eye, there would not be a greater difference in the temperature than I have stated. This fall in temperature corresponds to a liberation of about 42 calories, which is not more than one-tenth of the total heat in the slag, and should it be delivered to an equal weight of air would only heat the latter some 310° F. According to the composition of the charges and the

work to be done it takes from 1½ to 3 tons of air to smelt 1 ton of charge in blast furnaces, and it is my impression that the average ratio of air to charge in pyritic and semi-pyritic work lies between 1.5 to 1, and 1.75 to 1. The amount of proportion of slag produced under the different conditions of smelting is quite variable. Sometimes, as in pig iron production, it is no more than one-fifth the weight of materials charged; while in certain copper works it may rise to 80 per cent. of the weight. An average might reach two-thirds the weight, and I infer that Mr. Bretherton's mixture might yield about that proportion. I assume for the purpose of illustration that he gets about 55 tons in a day's run, which would contain a total amount of heat equal to that set free by the combustion of 3 2/3 tons of good coal, worth at Silver City presumably rather less than the price of coke, which, we learn incidentally from Mr. B.'s communication, is there $8 per ton. The total value of this amount of heat, stated in dollars, would be less than $29.33, as compared with that to be got from an equivalent amount of carbonaceous fuel. And, as the inventor can only recover, as I have in a manner shown, about one-tenth of this in his apparatus, we can reasonably fix upon $2.93 as the extreme value of the heat utilizable in this way. We can, however, concede to the invention a slightly better effect, inasmuch as it is apparently able to utilize the waste heat of the matte product also, which is governed by the following conditions: Matte has a specific heat of .12 or thereabouts, varying with composition, but averaging, in general, about half that of slag. Its latent heat is likewise low. It has no plastic stage, and can be cooled far lower without detriment to the capacity or effectiveness of the containing vessel. Its range of temperature while in the forehearth might very likely be twice that of slag, which would make up for its lower specific heat, by which it is rendered better adapted for Mr. Bretherton's purpose. If we assume that it may lose in the forehearth as much as 600° F., and still remain in condition to be tapped out, it is certainly an advantage to the apparatus, and as valuable from that point of view as the slag, ton for ton. With the ore mixture favored by Mr. B. the daily output of matte might very likely reach 10 tons, for example; and making the necessary corrections in the foregoing figures, I deduce that the weight of bituminous coal saved by the Bretherton apparatus in one day would be 866 lbs., worth, at the price of coke, $3.46. What I actually saved at Keswick by the use of my heating arrangement was an amount of fuel equal to 3 tons of coal per day, worth there at that time about $10 per ton, or $30 total. But a number of persons, noticing the exceedingly minute quantity of coke charged into the furnace—"a hat full of coke to a ton or ore," as they said—took it for granted that the saving was all due to the mechanism employed for heating the blast, thereby confounding the merits of the heating device with those of the pyritic process, which was the principal thing on trial. They were, of course, totally oblivious of the fact that the blast may be heated in other ways with just as good results, although not perhaps with such extreme economy. It appears to me that Mr. Bretherton, too, has fallen into this error in ascribing his results in pyritic work solely to his own inventions, whereas this style of work was carried on and pretty thoroughly established as a workable process before he took it up. Improvements in the mechanism of smelting plants must not be credited with all the gains, or what will be left to say of the process itself? Thus, Mr. B. saves, according to his statement, $152; but all of this—namely, the $120 saved in not roasting and bricking, and the $32 for 4 tons of coke—would likewise be saved by the use of any apparatus whatever which would heat his blast to the same temperature. What he actually saves daily as the direct result of heating the air by means of the slags instead of coal, under the assumptions I have made, is $3.46, and no more. To the pyritic process itself is to be ascribed the credit of saving the $152 per day.

Mr. Bretherton's statement is not clear upon several points that are worthy of attention. For example, he leaves us in the dark as to the actual temperature of the blast when it enters the apparatus and when it leaves it. The composition of the ores, the slags and their weights are left to be inferred, as also the quantity of matte produced as compared with that made in the previous running with cold blast and high fuel charge. The latter consideration, which appears in another form as the ratio of concentration effected by the smelting, is of the first importance practically and theoretically, and is usually much dwelt upon in inquiries into the applicability of the pyritic method. One would infer from the extreme high cost of roasting and bricking, namely, $3 per ton, that the operations were very thoroughly done, and that the result of the smelting which follows would be a high-grade matte, far less in quantity and richer in quality than could possibly be got by pyritically smelting the raw ore. I think, therefore, that Mr. B. may now, in the spirit of candor, admit an offset to his balance of profits.

My plan, as I have previously remarked, consisted in exposing the whole output of slag. fresh from the furnace, to the cooling influences of the air blast, by which it is progressively chilled. The design included some features which I think will commend themselves to engineers who may possess interest in the problem. In the first place the pots, carrying 1,500 lbs. of slag each, traveled in the contrary direction to the incoming current of air, so that the coolest air met first the coolest slag, and by this means produced an absorption of heat to a degree which would be impossible otherwise. This, of necessity, brought the hottest air in contact with the hottest slag, under conditions entirely favorable for securing the most elevated temperature possible. With a sufficiently long line of pots it would be possible to utilize, within the limits of efficiency of any heating apparatus, the whole caloric of the slag. With the improvements that have suggested themselves since, I believe that it would be possible to utilize, by a sufficiently extensive apparatus, not less than 65 per cent. of the entire heat, and to raise the air to 700° F., which is enough for the ordinary purposes of pyritic smelting.

The apparatus essential to a thorough application of the principle is extensive and necessarily cumbersome. There is no possible way to extract the heat of the slag other than to expose it for a sufficiently long time to the cooling influence of the blast, and this takes not only a prolonged time, but also many receptacles. At least one-quarter of the day's output of slag must be undergoing the cooling process at any time, necessitating the use of pots or other receptacles sufficient to contain it. While simplicity, cheapness and durability are prime factors in an installation of such a kind, the conditions of the problem do not admit of their attainment. We have to deal with large quantities of hot, sticky and disagreeable stuff which warps and cracks the iron cars or pots, prevents easy lubrication of the wheels, and demands heavy and strong apparatus, and much of it. Also this apparatus, bulky as it is, has to be situated on the slag floor near the furnace, where space is exceedingly valuable and can ill be spared. It is a fact, though, that the mere act of getting the slag away from the furnace and out to the dump is not hindered, but rather facilitated, the operation being effected through the use of hydraulic jacks, etc., which are a part of my mechanism.

An inherent difficulty with such apparatus lies in the unavoidable fact that in case the activity of the furnace decreases from any cause, the output of slag falls off, and the blast, finding less material to heat it, becomes cooler; and the furnace, which needs at such a time an increased blast temperature instead, falls into worse and worse difficulties as we proceed. Bad running breeds worse running, and good running better. Observe that Mr. Bretherton obviates this disadvantage by burning firewood upon the forehearth, this expedient being a step toward the employment of the pipe stove, as used in iron smelting.

It will be evident to engineers that the practice of heating the blast by the hot slag is scarcely in such an advanced state as would justify its general adoption in smelting works. The apparatus at command now is necessarily bulky and cumbersome and difficult to handle; and above all, the store of heat is not by any means so great as the popular impression would have it. It will be asked, why, if the conditions are so severe, is it not better to adopt the pipe stove at once and not seek farther to work out a new practice on such unpromising lines? But the stove has its own difficulties, which are not less trying than those of the slag heater; and considered as an apparatus for transferring heat its efficiency is fully as low, and it is faulty both in design and performance. As for those contrivances that profess to heat the blast by the caloric given off by the forehearth, I do not think that the results will often justify even the small outlay necessary. As for my own apparatus, I think it would be in place only where the cost of fuel was such as to make the saving over other modes of heating quite important, and where skill and attention could be bestowed upon the running. I believe that where coke fuel is costly, where the amount of ore to be treated is very large, and where it is desirable to obtain the slag in regular blocks annealed to considerable toughness (an end attained by my mechanism) the slag-heating arrangements devised by myself would prove advantageous. I say this with caution, however, knowing as I do the propensity of inventors to magnify their work, and realizing also the immature condition of the whole subject of blast heating.

Oakland, Cal., April 7, 1900. Herbert Lang.

AMERICAN LOCOMOTIVES IN GERMANY.—United States Consul-General Frank H. Mason quotes the following from the "Burger Zeitung" of Berlin, Germany: "The Prussian State Railway administration also intends to soon make a trial of American locomotives. These machines have shown that by reason of their great boiler space and heating surface they are more efficient and economical. The Ministry of Public Works at Berlin has directed that specifications of locomotives of American models shall be laid before it in order that it may ascertain, through trials of freight and passenger engines, whether the introduction of that system here is advisable. The similar tests which the Bavarian State railways have made with American freight engines have had the most satisfactory results; they have, as the minister reports, 'with faultless performance, cost considerably less than locomotives of similar class belonging to the Prussian railway system.' It need hardly be explained that if these engines demonstrate their superiority and are adopted, they will not be built in any foreign country." Concerning this, Mr. Mason says: "It has been evident from the first that the American locomotives brought to Germany during the past six months were—like American stoves, machine tools, pumps, and various other machines and articles not patented in this country—intended mainly to be tested, studied, and used as models to be imitated by German builders. It is a sincere and flattering compliment, and, although not directly and largely profitable to American builders, has still its value as an illustration of the importance of protecting as far as possible, by German patents, every American invention or improvement that is sold for use in this country."

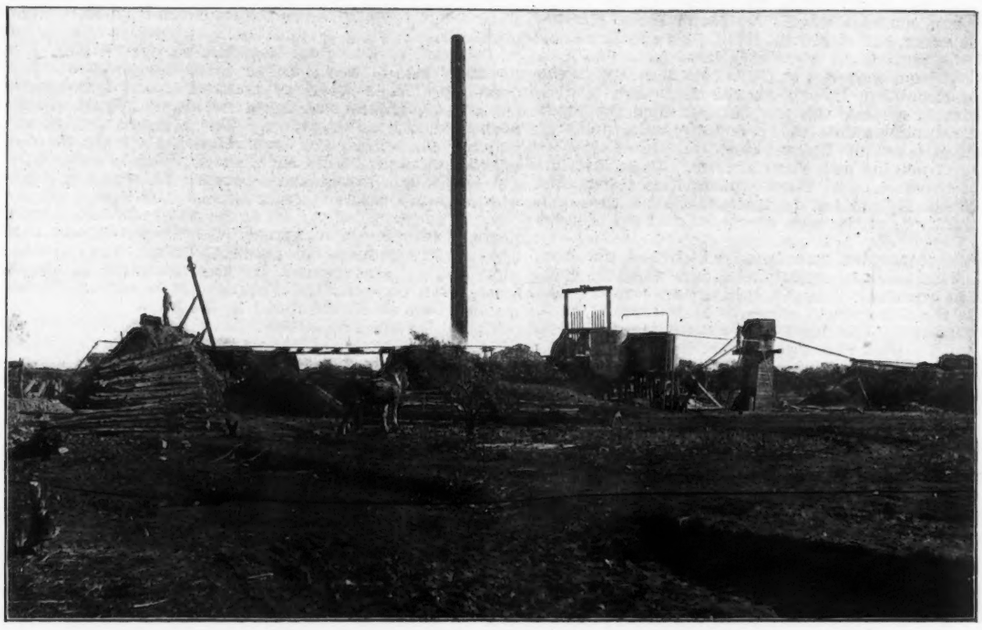
THE MANUFACTURE OF SLATE PENCILS.—Slate pencils were formerly all cut from solid slate just as it is dug from the earth. Pencils so made were objected to on account of the grit which they contain, which would scratch the slates. To overcome this difficulty, Col. D. M. Steward devised and patented an ingenious process by which the slate is ground to a very fine powder, all grit and foreign substances removed, and the powder bolted through silk cloth in much the same manner as flour is bolted. The powder is then made into a dough, and this dough is subjected to a very heavy hydraulic pressure, which presses the pencils out the required shape and diameter, but in lengths of about 3 ft. While yet soft the pencils are cut into the desired lengths and set out to dry in the open air. After they are thoroughly dry the pencils are placed in steam baking kilns, where they receive the proper temper. Pencils made in this manner are not only free from all grit, and of uniform hardness, but are stronger than those cut out of the solid slate. For these reasons they have entirely superseded the old kind. Over 25,000,000 pencils were made and sold in the year 1899 by the D. M. Steward Manufacturing Company of Chattanooga, Tenn.

As the use of pencils in this country has greatly decreased in the last decade, a foreign market has to be secured for this enormous output. The Steward Company is now sending pencils to almost every civilized country in the world, including Japan, China and India, as well as Europe.

A MINE IN WESTERN AUSTRALIA.

The accompanying illustrations are reproductions of photographs for which we are indebted to the courtesy of Mr. Edgar Hall of Tenterfield, in New South Wales. The photographs were taken at the Lancefield Mine in the Mount Margaret District in Western Australia. The first is a general view of the mine, the second shows a point in the open-cut workings, while the third is a view of the mill and machinery. These show well the open-air way in which work is carried on in that region. Rain falls so seldom that there is no need of shelter; the stamps and also the engine and compressor have not even a roof over them.

The Mount Margaret District is well thought of locally and promises to become a large producer. The Lancefield Mine promises well.



LANCEFIELD GOLD MINE, WESTERN AUSTRALIA.

OPEN CUT, LANCEFIELD GOLD MINE, WESTERN AUSTRALIA.

The lode averages 20 ft. wide through the 24-acre lease included in the property. The lease is held by a company of working miners who have opened up the mine and had faith in it. They bought the stamp mill and put it up at a total cost of £750. This mill has been at work since February last and the returns have averaged 8 dwts. a ton in free gold, besides nearly as much more in the tailings, which can be saved by cyaniding. The owners have been able to pay all working expenses, to pay for 10 stamps additional—making 20 now in the mill—and to put up a cyanide plant.

The photographs are of interest from the way in which they illustrate the conditions of mining and milling in the colony.

BIG TUNNEL WORK.—In the De Lamar Tunnel at De Lamar, Idaho, during the first three months of 1900, the following advances were made: January, 402 ft.; February, 398 ft.; March, 402 ft. This is certainly fast work. The total length of the tunnel on April 1st was 2,958 ft.

GERMAN DEMAND FOR COAL.—United States Vice-Consul-General Hanauer, of Frankfort, on April 10th, 1900, reports that a reputable coal dealer of that city (who supplies one of the largest chemical factories in the vicinity) has just called on him in order to learn the names of standard coal companies in the United States. He says his firm wants —if prices and quality of coal are suitable—a contract for 500,000 tons for the next 12 months. He also states that the production of Germany in this line is short of the demand this year by 4,000,000 tons.

THE TRANSVAAL MINING INDUSTRY FOR THE SECOND HALF OF 1899.—VI.*

Special Correspondence of the Engineering and Mining Journal.

(Continued from Page 436.)

A report submitted late in January by the Government surveyor, Mr. J. Lonsdorfer, states that, as soon as possible after receiving orders, he organized his staff and proceeded to make plans of the mines which the Government had commandeered. He found many difficulties in the way, some of which are stated in detail. At the Robinson Mine the few copies of the mine plans were very imperfect; they had not been brought up to date and were not made in compliance with the mine regulations of the Republic. In some cases they were far behind, and the recent work in stoping was not entered upon the plans at all. It was consequently impossible to fix definitely the point at which the Government had taken up the workings, and it was necessary to take up the work of making new plans at once. As an instance of the incompleteness of these plans at the Robinson it is stated that a total surface of 27,175 sq. ft. had not been drawn in on the plan, which, at the average thickness of the reef, amounted to 5,000 or 6,000 tons of ore.

At the Ferreira Mine a stope plan was found which had not been prepared in accordance with the mine regulations, but was still sufficiently clear to be used in working. It had not, however, been brought up to date, and with this the Government surveyor finds especial fault, since nearly all the stopes on the first level of the south reef had been worked up to the company's line, and there might easily have been a trespass on the neighboring claims. At the Bonanza absolutely no plans could be found, so that detailed measurements and surveys were necessary before anything could be done.

The report of Mine Inspector G. Kubale, who was placed in charge of the Rose Deep Mine for the Government, shows the condition of that mine when possession was taken. The report was submitted early in January. Mr. Kubale says that he found at the mine about 20 whites and 265 Kaffirs, who were in a state of excitement, as C. W. Burnham, an American, who had been left in charge, could not be found, and had taken with him the money which was intended to pay off these men. However, Mr. Carpenter, the representative of the Eckstein House in Johannesburg, settled this question by advancing the money and paying the wages. The books of the mine had all been removed and the only record to be found was the storeroom book, which had not been written up to date. It was necessary, before doing any work, to take inventories and find the actual condition of affairs. Of the white workmen at the mine 8 remained with the Government manager and all the Kaffirs were retained. The first ore was raised from the mine November 20th, and the mill was started November 26th. Soon after, with the aid of the Government police, the working force was increased to about 1,000 Kaffirs.

The work at the mine, the mill and the cyanide works, had been stopped October 5th, or 41 days before the Government took possession. The pumps had been kept at work, so that the mine was dry. The Rose Deep has three shafts, two of which are completed, and are both combined vertical and inclined shafts. No. 3 shaft had been carried down about 400 ft., and was found full of water, sinking having been suspended for a considerable time. The timbering of the two completed shafts was in bad condition at different points, and the guard rails required much repair.

A sorting and crushing house is situated about half way between the two completed shafts, and is connected with them by wire-rope haulage. The surface cars brought to this station are raised by an elevator and the ore dumped upon the grizzleys. The arrangement is not a good one, as it requires a loss of time and more labor than should be necessary. The building contains a revolving sorting table with three Comet crushers. The main mill contains 200 stamps, built by Fraser & Chalmers, and of large size, the weight of each being 1,250 lbs. The cyanide plant consists of a tailings wheel, 28 tanks of 400 tons capacity, and a well furnished extractor house. There is also a blacksmith shop, a small machine shop and a carpenter shop for repairs. At the two working shafts there are three hoisting engines, two Cornish pumps, three air compressors, and two dynamos for lighting. The other buildings include storeroom, assayor's house, the dwelling houses for the white workmen and the native compound. There are two reservoirs for the return water from the mill, each supplied with a pump; a cooling tank for the condenser water and four iron tanks for mill supplies, each of 190 cu. m. capacity.

The condition of the mine below was very poor. Development was backward, so that very little ore had been blocked out ahead, and much of this work had to be done before the mill could be started up regularly. At the Rose Deep three gold reefs are worked; the North, the Middle and the South reef, besides some small leaders. In some places the three reefs are so close together that they can be stoped out together. At other points there is a thickness of from 1 to 2 m. of waste rock between the reef, and at these points much additional work is needed for handling the waste material. The general condition of affairs gave the impression that the mine had been picked over and the best ore taken out without any consideration for proper or systematic working. It looks also as if in some cases a reserve of good ore had been taken out and left in the mines, apparently with the object of evening up the output in poor months. The hoisting arrangements were not judiciously made, too large a share of the work being thrown upon one shaft, which was really overcrowded. The Government manager has made new plans to remedy these difficulties, but has not yet been able to carry them out, as some time will be required.

It is to be observed, however, that a good deal of the fault found should be charged to the bad systems employed, all the work being really managed from the central office of the Ecksteins in Johannesburg, while the mine manager had very little to say, and was really nothing more than a superior mine captain. Many things were ordered here, as at other mines under the same management, without any proper consideration of local matters.

The cyanide works were found in good condition, requiring only a little repair to the pumps. Everything had been cleaned out of the extractor house and no gold was found. The iron storage tanks were simply placed upon the ground, and the pipe connections were bad. There is a slimes plant under construction, but not far enough completed to be used. The assay office and smelting room were bare of material. The dynamos had not sufficient power to light the mine, and the electric lighting system was very defective, both underground and on the surface. The Rose Deep had no water rights or dam of its own, the chief supply being drawn from the pump of the Knight's Deep Company. When work was started it was found necessary to establish a new pumping station, as the electric pump which had previously been used was under water. This required a general change in the pipe system, which took some time. A supply for the boilers is obtained by pumping from No. 2 shaft, which is sufficient for the purpose. The slimes dam had not been properly finished and a good deal of work was necessary before it could be made safe.

As to quarters for the men, the white dwellings were either incomplete or insufficient in extent; the compound had a combination for 2,500 Kaffirs and was in good condition. The company had no hospital and no arrangement for the treatment of the sick. The food stores were very small in quantity in the storeroom, but a quantity of mealies were afterward found in the mine.

The staff employed at this mine by the Government inspector was as follows: Chief engineer, R. de Kat, late Government boiler inspector; secretary, P. Heidelberger; mill manager, C. D. Currie; mine manager, C. H. Bryhn; cyanide manager, J. C. Dam; compound manager, W. F. Walker. The surveys of the mine were carried out under charge of Mr. Lonsdorfer, the Government surveyor.

(To be Continued.)

* Previous papers in this series have appeared in the "Engineering and Mining Journal," March 10th, 1900, page 287; March 17th, page 317; March 24th, page 347; March 31st, page 377; and April 7th, page 426.

FIGHTING A FIRE IN AN ANTHRACITE COAL MINE.

The report of Chief Engineer Heber S. Thompson of the Girard Estate, gives the following account of a fire in an anthracite colliery and the measures taken to extinguish it.

"On Monday, November 27th, 1899, at 6 a. m., the west gangway of the Mammoth bed on the second slope level was found to be filled with smoke and gas, indicating a mine fire burning somewhere in the western workings. The gas was at first an obstacle to an examination to determine the location and extent of the fire, but by 12 noon the measures taken to restore the ventilation had cleared away the gases sufficiently to admit of an examination. A fire was then found burning in the gangway and in both chutes of breast No. 43. The superintendent of the colliery, Mr. Thomas Baird, with a force of men, promptly attacked the fire with chemical fire extinguishers and with water thrown by hand in buckets, and succeeded in a few hours in extinguishing the fire in the gangway and in the west chute of the breast and in following it some distance up the east chute. In the east chute of breast No. 43 the refuse coal fallen in a pile was a mass of fire, 6 ft. wide and 4 ft. high, burning vigorously against the top of the chute. By midnight this had been extinguished for a distance of 28 ft. up the chute. After that hour the gases began to come down over and behind the men at work, and by 2 a. m. drove them out of the gangway and altogether away from the fire.

"On Tuesday, November 28th, a stronger current of air was established, which removed the gases and permitted a resumption of work upon the fire. It now became evident that a larger volume of water was required to fight the fire, extinguish and follow it up rapidly, and prevent its extension to other parts of the mine. A line of 2-in. gas pipe was therefore laid down the Ringtown Road Slope and along the gangway to the fire, connecting on the surface with the pipe from the small reservoir on the hillside at this point. Three lengths of hose were obtained, and attached to the inside end of the pipe, and by 7.15 p. m. Tuesday the water was going through the pipes upon the fire. During Tuesday night the fire was extinguished for a distance of 44 ft. in the outside chute of breast No. 43. On Wednesday another small body of fire was found a short distance beyond this and extinguished. During that day and night, and for several days thereafter, the water was kept playing upon the heated coal and masses of fallen material which had been on fire. The insecure places were timbered to prevent their closing in, and all workings in the vicinity were carefully examined; men were kept at work day and night to prevent the possibility, if fire existed anywhere, of its becoming established to a dangerous extent. No more fire was discovered. The heat, gases and odors of burnt material diminishing day by day, it was demonstrated that there was no longer any fire existing anywhere in the vicinity.

"The origin of the fire it is impossible to determine with positive certainty. Miners and drivers had been at work in this part of the mine on the Saturday afternoon previous to the discovery of the fire on Monday morning. It is probable that the fire was due to the carelessness of one of them. A spark from a lamp lodged among dry wood, a lamp flame touching for a few minutes a collar or other timber, a lamp wick not entirely extinguished thrown aside among combustible material, may have started the fire, which, burning slowly, was unobserved by the men upon quitting work.

"The superintendent now has the mine thoroughly examined each day after the men quit work, by inspectors with lanterns, and again every Sunday morning, when there are no men at work."

A RECORD-BREAKING RAIL OUTPUT.—The record for turning out steel rails was again broken at the plant of the Illinois Steel Company on March 22d, when the day shift put out 1,442 tons in 12 hours. The previous record for 12 hours was 1,391 tons. Following the breaking of the world's record the night shift turned out 1,235 tons, making a total for 24 hours of 2,677 tons. During the 24 hours the rolls were shut down 1 hour and 57 minutes.

AN EXAMINATION OF THE ORES OF THE REPUBLIC GOLD MINE, WASHINGTON.*

By T. M. Chatard and Cabell Whitehead.

The Republic Mine, situated in the northeastern part of the state of Washington, 40 miles from Marcus, a station on the Spokane Falls & Northern Railroad, was located in 1896, but no development work was done until the spring of 1897. While much of the ore mined since then has been rich enough for shipment to smelters, a method of locally treating the lower grade ores soon became a matter of prime importance, because only about 40 per cent. of the values could be recovered by plain amalgamation even with ores assaying 4 to 5 oz. gold per ton. Experiments with cyanidation, in various ways, led to the adoption of the Pelatan-Clerici process and the erection of a 10-ton experimental plant on this system, which was later increased to a capacity of 35 tons per day. The extractions by this process showed much improvement over previous work, especially when the ore was crushed to 120 mesh, but the general results were not very satisfactory to the owners, since the extractions on rich ore were not over 85 per cent., falling to as low as 70 per cent. with the $30 ore. In the search for the cause of these losses and for improvement of methods, samples of these ores were sent to us for examination.

The ore, as received by us in September, 1898, consisted in great part of greyish white lumps and fragments of chalcedonic material intermixed and coated with a softer, friable substance having the appearance of amorphous silica. It could be easily pulverized to pass a 100-mesh screen but, even in this state of fineness, the most careful panning failed to show more than a minute quantity of sulphurets. No free gold could be detected, even with a powerful magnifying glass, although our assays showed a value of 6.80 oz. per ton. Careful search proved the absence of arsenic, antimony, tellurium and selenium, and there appeared to be no chemical reason why the gold should not be easily extracted by cyanide. Moreover, when a sample of the ore was treated with hydrofluoric acid, the gold in the residue was clean and bright and, under the microscope, showed indications of crystallization.

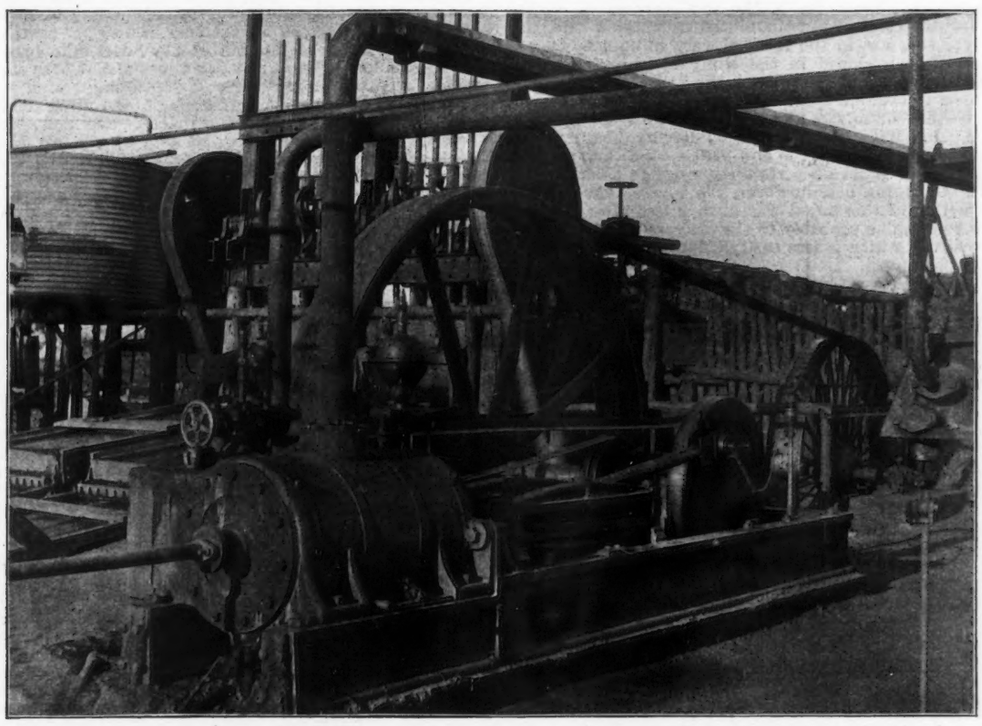
The ore was then crushed to pass 60 mesh, thoroughly mixed, sampled and assayed, giving a value of 6.30 oz. gold and 6.15 oz. silver per ton. Twenty-five pounds were then treated in the Aurex sluice recently described by us†, the strength of the cyanide solution used being 0.286 per cent. KCy and the duration of the run being one hour. The tailings assayed 2.10 oz. gold and 2.80 oz. silver, showing an extraction of only 66.66 per cent. gold and 54.49 per cent. silver, a result quite inexplicable considering that the gold was apparently perfectly free; the test was therefore repeated, using a stronger solution (0.376 per cent. KCy) and increasing the time of treatment to two hours, but with no better results. Crushing to pass 80 mesh showed improvement, the tailings assaying 1.45 oz. gold and 1.90 oz. silver, giving an extraction of 77 per cent. gold and indicating the advantage of still finer grinding. We therefore ground the remainder of the ore to pass 100 mesh and then, on treatment, obtained tailings which assayed 0.48 oz. gold and 1.02 oz. silver, an extraction of 92.38 per cent. gold and 83.41 per cent. silver.

This first lot of ore having become exhausted, more was obtained, part of which was mill pulp assaying 2.50 oz. gold and 3.75 oz. silver, the rest being coarse ore assaying 2.30 oz. gold and 2.50 oz. silver. As fine grinding seemed to increase the extraction, this mill pulp, which had been ground to pass 120 mesh, should have been peculiarly fitted for treatment, but the best results in the sluice gave tailings assaying 0.40 oz. gold and 1.55 oz. silver, or an extraction of 84.00 per cent. gold and 41.33 per cent. silver. Since, however, the percentage of extraction increased with the fineness of grinding, it was fair to presume that the residual values were mainly contained in the coarser portion of the tailings, which were then separated into sands and slimes, there being about 60 per cent. of the latter. To our surprise, the two portions assayed practically the same, although the gold in the sands could then be comparatively easily extracted by percolation. In view of this, another portion of the pulp was taken, mixed with the cyanide solution, allowed to stand over night and then run as before, giving tailings assaying 0.25 oz. gold and 0.75 oz. silver, the values being confined mainly to the slimes.

It now became necessary to devise a method of treating these slimes, and, as they remained in suspension for an indefinite period, some means of precipitating them was needed. Neither lime nor common salt gave good results, so sulphuric acid was tried. A slight effervescence was noted and a small portion of the suspended material appeared to go into solution while the rest began to subside; on making the emulsion alkaline, the material flocculated and subsided rapidly. On repeating this experiment with the original ore, we found that the acid solution contained alumina, oxides of iron and lime, while the residue, on panning, showed much free gold, although none could be found in the untreated ore. As the acid appeared to liberate the gold, it was at first supposed that carbonate of lime was the masking agent, so another portion of ore was calcined before cyaniding. Great improvement was noted, the sluice extraction being brought up to 94.60 per cent. gold, the tailings assaying 0.135 oz. gold per ton. These were separated into sands and slimes as before, the slimes now settling quickly and containing only 0.05 oz. gold per ton. The sands amounted to 50.6 per cent. of the whole, peroculated freely and were treated with cyanide solution, giving a further extraction of 0.058 oz. gold and making a total extraction of 96.92 per cent. gold, or a final value in the tailings of 0.077 oz. gold per ton.

We now found that our coarse ore contained no carbonate of lime, and yet that calcining had the same beneficial effect, the calcined ore showing, on panning, much free gold and giving a good extraction in the sluice. It became evident that it was not carbonate of lime, but some other constituent of the ore, which interfered with the extraction of values until it was either removed by the acid or rendered innocuous by heat.

A sample of the coarse ore was finely pulverized and the metallic iron present removed by a magnet. Ten grammes were then digested on the water bath for one hour with hydrochloric acid diluted with an equal bulk of water and then filtered. The washed residue was then digested with a hot solution of sodium carbonate to extract any silica rendered soluble by the acid treatment, while the acid solution was evaporated to dryness to recover any dissolved silica. The solution was then analyzed by the usual methods and the complete results were as follows: Insoluble residue, 97.11; soluble silica, 0.31; alumina, 0.33; ferric oxide, 0.40; ferrous oxide, 0.29; copper, 0.016; zinc, 0.025; lime, 0.066; magnesia, Tr.; sulphur, 0.060; phosphoric acid, 0.018; water, 1.53; total, 100.155.



Stamp Mill and Machinery at Lancefield, Western Australia.

*Paper read at the Washington meeting of the American Institute of Mining Engineers, February, 1900.

†Notes on the Aurex Sluice. "Engineering and Mining Journal," February 3d, 1900, page 138.

This analysis indicates that the material which envelops the gold and prevents its dissolving in the cyanide, consists mainly of hydrated oxides of aluminum and iron, since the amount of "soluble" silica is insufficient for any known combination with the bases even if we suppose that all of it was originally so combined. The sulphur probably exists partly as sulphides of iron, zinc and copper, partly as sulphates, but the small amount of the total made it hardly worth while to determine the proportion. Some of the lime may exist as carbonate, but the amount must be very small since no effervescence could be noted on treating with acid.

In the "Engineering and Mining Journal," December 16th, 1899, page 726, the following analyses, A and B, of Republic ores, are given, an analysis by us, C, being added for comparison:

	A.	B.	C.
Silica	85.61	90.55	94.41
Alumina	6.37	4.73	2.95
Iron oxide	3.16	2.57	1.29
Copper	....	....	.016
Zinc	Tr.	....	.025
Manganese	....	.20	Tr.
Lime	....	.90	.06
Lime carbonate	4.37	...	...
Sulphur	.04	...	.06
Water	...	1.20	1.14
Total	99.55	100.15	99.95

Analysis A shows, as do many of our own tests, that the Republic ore often carries much carbonate of lime, but our work has convinced us that this substance is not the cause of the low extractions, which are really due to hydrated oxides of aluminum and iron. As a rule, the gold and silver in these ores are in the form of very minute particles, and these appear to be so enveloped in the slimy hydrates as to be floated off by the water when the ore is panned, the hydrates also forming a coating impervious to cyanide solutions. When the ore is treated with acid the hydrates are dissolved and the gold, thus set free, is easily collected in the pan. The action of heat, by driving off the water of hydration, leaves the oxides in a porous and brittle condition, so that they either separate from the gold or permit the cyanide solutions to reach and dissolve it. Calcining has, however, the reverse effect upon the silver, as the extraction of this metal was always less after the ore had been heated than before, due probably to the conversion of sulphide of silver into metallic silver, which is less easily soluble in cyanide than the sulphide.

While the results of this investigation have given interesting suggestions as to the genesis of this remarkable deposit, a discussion of these is foreign to the purpose of this paper, which is to call attention to the importance of thorough chemical examination of such gold ores as, without apparent cause, do not yield their values to the usual processes. Proper investigation will always show the cause and rarely fail to indicate the remedy.

LOSSES IN THE DETERMINATION OF GOLD AND SILVER IN COPPER BULLION, THEIR CAUSES, AND A METHOD FOR OVERCOMING THEM.

Written for the Engineering and Mining Journal
by W. Randolph Van Liew.

(Concluded from page 470.)

To find out what influence, if any, and to what extent, if possible, the various gases produced on dissolving copper in HNO_3 affected the solution of gold, each of these gases was produced artificially and individually, and the bearing they exercised on the solution of the gold established.

When HNO_3 acts on copper the reaction that takes place is

$$Cu + 2\ HNO_3 = Cu\ (NO_3)_2 + 2\ H$$

and the action of the nascent, H, upon HNO_3 is:

$$2\ HNO_3 + 6\ H = 2\ No + 4\ H_2O,$$

or, the complete reaction may be represented thus:

$$8\ HNO_3 + 3\ Cu = 3\ Cu\ (NO_3)_2 + 2\ NO + 4\ H_2O$$

Nitric oxide (NO) then, is the gas first liberated on dissolving copper with nitric acid.

The most characteristic property of nitric oxide is its power to combine directly with oxygen when the two are brought together. The act of combination is accompanied by heat. In the reaction which takes place either nitrogen trioxide (N_2O_3) or nitrogen peroxide (NO_2) is formed according to the conditions.

$$2\ NO + O = N_2O_3$$

or

$$2\ NO + 2\ O = 2\ NO_2.$$

This change from the colorless NO to the reddish brown fumes of N_2O_3 and NO_2 can be readily seen on dissolving the copper in nitric acid.

With cold water N_2O_3 undergoes decomposition accompanied by an evolution of nitric oxide.

$$3\ N_2O_3 + H_2O = 2\ HNO_3 + 4\ NO.$$

NO_2 when in contact with water undergoes decomposition if the temperature be low, HNO_2 and HNO_3 are formed, thus:

$$2\ NO_2 + H_2O = HNO_2 + HNO_3.$$

The influence of nitrogen trioxide (N_2O_3) gas was determined as follows: HNO_3 of sp. gr. 1.30 was added to a 300 c.c. Erlenmyer flash containing As_2O_3, the gas produced being conducted from one Erlenmyer to another containing c. p. gold in a 50 per cent. HNO_3 solution; at the end of one-half hour the production of N_2O_3 was stopped and the loss of gold was found to be nothing. On further treatment the gold at the end of 1½ hours gave the following results: Gold taken, 46.06 mgs.; gold found, 46.06 mgs.; taken, 0.630; found, 0.630 mgs.; showing no loss of gold at the expiration of this time. These results were obtained the receiver being kept at a temperature of 90° C. When repeated, and the receiver kept surrounded by a freezing mixture, the results were the same, no loss of gold.

To test the influence of nitrogen peroxide (NO_2) gas as effecting a solution of the gold, the gas, produced by heating $Pb\ (NO_3)_2$ in a combustion tube, was conducted into an Erlenmyer containing a 50 per cent. solution of HNO_3 and c. p. gold; the result was that, in a solution kept at a temperature of 80° C., the gold influenced for 1½ hours by the presence of this gas being passed through the HNO_3 solution, showed, in one case, 46.06 mgs. of gold taken and 46.06 mgs. of gold found.

In another instance, 1.120 mgs. were taken and 1.120 mgs. found. These experiments were also conducted keeping the HNO_3 solution containing the metallic gold down to a temperature of 15° C., with the same results, no loss of gold through the presence of NO^2 being indicated.

The effect of nitrous acid (HNO_2) in combination with nitric acid (HNO_3) in causing a solution of gold, was next tried. According to Remsen, nitrous acid may be formed by treating potassium nitrite with sulphuric acid, the reaction which takes place being as follows:

$$2\ KNO_2 + H_2SO_4 = 2\ HNO_2 + K_2SO_4.$$

The nitrous acid then partly being broken up into nitrogen trioxide and water:

$$2\ HNO_2 = N_2O_3 + H_2O$$

KNO_2 was formed by fusing KNO_3, mixing thoroughly in the fused mass an excess of metallic lead, dissolving in water and filtering off the Pb O and Pb, the KNO_2 being obtained in the filtrate.

By treating this solution of KNO_2 with H_2SO_4 in an Erlenmyer flask and conducting the gas into another flask containing gold and a 30 per cent. solution of HNO_3, the influence of the nitrous acid (HNO_2) in causing a solution of the gold, was tested. Using 92.96 mgs. of pure leaf gold and conducting the nitrous acid in a 30 per cent. solution of HNO_3, it was found that, at the end of 2½ hours, the leaf of gold weighed 61.60 mgs., a loss of 31.36 mgs., or a loss of 33.7 per cent. of gold.

Again, a cornet of gold weighing 0.630 mgs., after being subjected to the combined action of the nitrous acid and nitric acid, under the same conditions as above, but, for the space of one hour, weighed 0.307 mgs., a loss of 0.323 mgs., or a loss of gold of 51.9 per cent. Experiments Nos. 3 and 4, in the same manner, on 20.060 and 1.340 mgs. of gold, showed losses of 28.9 and 38.4 per cent., respectively. These experiments were conducted with the temperature of the receiver maintained at 82° C.

To ascertain the influence of temperature on the solution of the gold in such an instance, the receiver was surrounded by a freezing mixture which kept the temperature down to 15° C. Conducting the operations in every respect the same as above, in only that the temperature was maintained at 15° C. instead of 82° C., it was found in one instance, taking 93.76 mgs. of pure gold, there was obtained at the end of 2½ hours' action, 92.96 mgs., a loss of 0.80 mgs., or a loss of 0.85 per cent. of gold. In another trial, taking 1.120 mgs. of gold, 1.098 mgs. were found, or a loss of 0.022 mgs., a loss of 1.98 per cent.

These results proved that, as far as a loss of gold was concerned, an excess of Na Cl solution exercised no influence, that, as far as combining with the nitric acid solution to cause a solution of the gold, neither nitric oxide (NO), nitrogen peroxide (NO_2), or nitrogen trioxide (N_2O_3), whether the operation be conducted in hot or cold solutions, caused a detectable loss of gold, but, that when nitrous acid gas (HNO_2) was combined with a nitric acid solution, there resulted, when the operation was conducted in a hot solution of 82° C., a loss of gold varying, in four different trials, from 28.9 to 51.9 per cent., and that when these trials were conducted in all respects under similar conditions, excepting that the temperature was maintained at 15° C., the loss varied from 0.85 to 1.98 per cent. The extreme loss in the case of the hot solution is, of course, intensified as compared both to the amount of gas given off and the conditions that would exist in actual practice; but from the above influence of heat in effecting a solution of the gold when HNO_3 is present in the HNO_3 solution, it emphasizes the necessity of keeping the solution as cold as possible during the dissolving of the copper.

The method finally evolved by the writer to overcome this solution of the gold by nitric acid combined with nitrous acid, and at the same time, to keep the silver loss down to the lowest possible point, was as follows: The copper weighed in duplicate of 1AT samples each, was treated with 350 c.c. of very cold water and 100 c.c. of HNO_3 (sp. gr. 1.42), the breakers were set in a cool place, and the temperature, even with the heat evolved by the conversion of NO to N_2O_3 and NO_2 was by the bulk of H_2O present, kept down to 15° or 16° C. At this temperature and with this degree of acid strength the dissolving of the copper takes place very slowly. At the end of 18 or 20 hours enough acid is added to take in solution the rest of the copper, this amount will vary from nothing to 30 c.c. of HNO_3 (sp. gr. 1.42) depending on the fineness of the borings or granulations. At the end of 24 or 26 hours the solution of the copper is complete. Instead of removing the lower oxides of nitrogen by boiling or heat, compressed air was used. Air, at a pressure of 2 oz. was conducted through a pointed glass rod, when, the space between the surface of the solution and the watch glass, clear until then, becomes filled with the reddish brown fumes of N_2O_3 and NO_2. At the end of 20 to 30 minutes these lower oxides of nitrogen are entirely removed. Compressed air was used because it happened to be in the labroatory, any form of hand blower could be substituted for the production of the air. By this method of solution, heat is applied at no stage of the process, and the loss of gold is thus minimized.

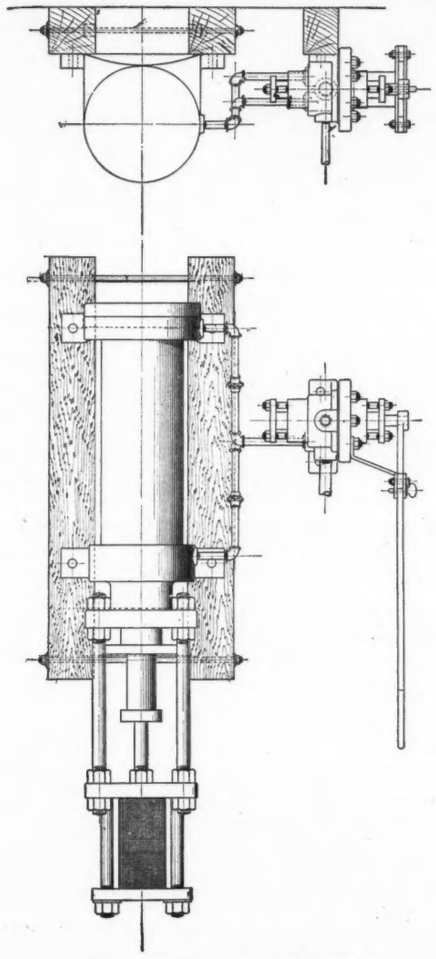
Experiments having shown that no difference was made, whether the gold was filtered off before, or, after the addition of the normal Na Cl solution, there was added to the cold solution of $Cu\ (NO_3)_2$ an excess of from 2 c.c. to 4 c.c. of normal Na Cl solution, besides that amount necessary to precipitate all the silver present.

The next morning the Ag Cl was filtered off, the entire contents of the filter washed to the point of the filter paper and the mass of Ag Cl covered with 4-6 gms. of test lead, the drained papers were then placed in 2½ in. scorifiers whose bottoms contained about a gramme of test lead, the papers were then dried, and burned in a furnace not yet to a temperature of incipient redness, the filter papers not being allowed to burn to a complete ash in the furnace, but, removed at the end of the yellow flame of the papers, have, when, they attained a heat suffi-

ciently great to burn the carbon of the charred paper outside of the furnace, this slow combustion taking place at a temperature too low to cause any loss of Ag in being reduced from Ag Cl. At the end of 20 minutes the papers will have ashed, when no more lead was added, but from 3-4 gms. of litharge and from 3-4 gms. of borax glass.

The copper all having been washed away in transferring the Ag Cl to the point of the filter, no scorification is necessary to get rid of any impurities, so this operation is merely one of melting and collecting the Ag and Au, the scorifier being poured as soon as the slag is hot enough. The resulting buttons of lead weigh from 4 to 5 gms. and are cupelled at a temperature giving heavy litharge feathers and allowed to blick at the temperature they are run, there being no difficulty as to every trace of lead going off when no other impurities are present. When run this way duplicates easily check, on the silvers, within 0.2 and 0.3 oz. The time of operation is 48 hours instead of 24 hours by the usual method.

The accompanying table, made up from samples of chemically pure silver, gold and copper, the silver and gold being fused with a blowpipe and parted before the addition of the copper, when the operations were



HYDRAULIC AMALGAM SQUEEZER.

conducted in all following respects similiar to the working tests, will give an idea as to the accuracy of the method.

	C. P. Silver.			Ozs. per ton.		C. P. Gold.		
No.	Taken.	Found.	Loss.	Loss %.	Taken.	Found.	Loss.	Loss %.
1	50.00	49.00	1.00	2.00	0.293	0.292	0.001	0.34
2	50.00	49.20	0.80	1.60	0.289	0.288	0.001	0.34
3	50.00	48.80	1.20	2.40	0.274	0.274	0.000	0.00
4	75.00	73.50	1.50	2.00	0.480	0.480	0.000	0.00
5	75.00	73.80	1.20	1.60	0.500	0.500	0.000	0.00
6	75.00	73.60	1.40	1.35	0.500	0.500	0.000	0.00
7	100.00	98.10	1.90	1.90	0.340	0.340	0.000	0.00
8	100.00	98.30	1.70	1.70	0.400	0.398	0.002	0.50
9	100.00	98.20	1.80	1.80	0.600	0.597	0.003	0.50
10	150.00	146.70	3.30	2.20	0.440	0.440	0.000	0.00
11	150.00	147.00	3.00	2.00	0.800	0.800	0.000	0.00
12	150.00	147.10	2.90	1.93	0.960	0.960	0.000	0.00
13	175.00	172.00	3.00	1.74	1.008	1.005	0.003	0.30
14	175.00	171.60	3.40	1.90	1.500	1.497	0.003	0.20
15	175.00	171.80	3.20	1.80	1.800	1.800	0.000	0.00
16	200.00	196.10	3.90	1.95	2.000	1.998	0.002	0.10
17	200.00	196.00	4.00	2.00	2.500	2.500	0.000	0.00
18	200.00	196.20	3.80	1.90	3.000	2.994	0.006	0.20

This method was run side by side with the standard 24 hours method on the daily samples of converter copper; the period of comparison was three weeks; covering that time there was, of course, no difference in the silver, but there was an average gain of 6.75 per cent. of gold in favor of the 48-hour method.

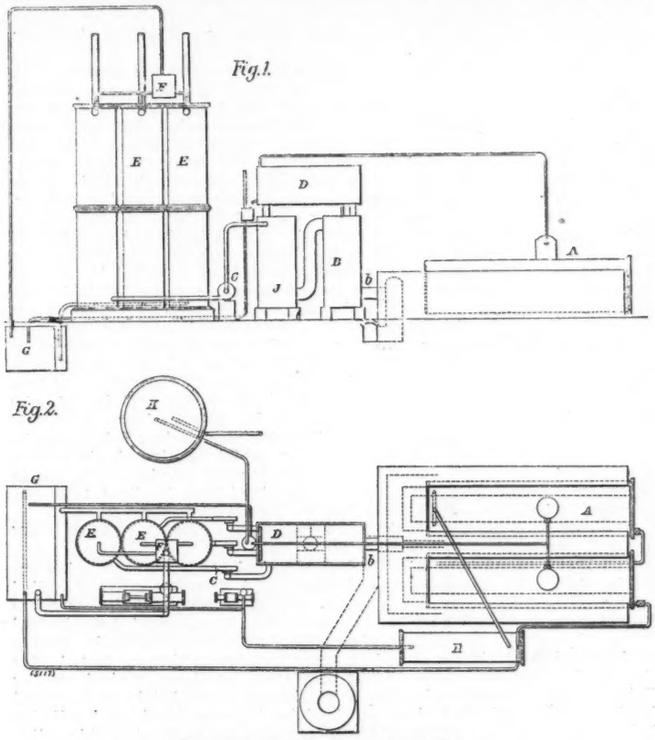
The method may be objected to on the ground of the extra consumption of time, but, where a product of perhaps several millions of dollars per year is to be valued, time should be the last consideration where accuracy is involved.

HYDRAULIC AMALGAM SQUEEZER.

The accompanying illustration shows a very neat device made by Fraser & Chalmers for the Alaska Treadwell Mill on Douglas Island, Alaska. It is a simple and effective arrangement for squeezing the amalgam taken from the plates and from the mortars of free-milling gold mills, before passing it to the retort, the object being to squeeze out to the greatest extent possible all surplus quicksilver. The construction will readily be understood from the sectional drawing shown. The amalgam is placed in a canvas sack, which is inserted in the perforated cylinder, and the ram forced against the bag carrying the amalgam. By reversing the four-way valve, the ram is backed out of the cylinder, and the amalgam can then be removed and retorted in the ordinary way. It may be operated either by water or compressed air.

THE MANUFACTURE OF LIQUEFIED CARBONIC ACID.*

The trade in compressed gas is of recent origin, but its growth has been rapid, and it is now of great commercial and industrial importance. Compressed oxygen is, perhaps, the gas best known to the general public, but there is also a great demand for liquefied carbonic acid, both for experimental and industrial uses. Under the former head the gas is



LIQUIFYING CARBONIC ACID GAS.

largely used as a refrigerant, and we have also known it employed as a handy method of obtaining a high fluid pressure, while industrially the makers of aerated waters are, perhaps, the best customers to the compressors. The preparation of this gas on a commercial scale has not, so far as we know, been fully described, at any rate, in England, so that an account of the London Carbonic Acid Gas Works at Dace-road, Old Ford, should prove of interest; the more especially in that these works are not only the largest existing, but are provided with a very efficient plant.

The carbonic acid gas is provided by burning coke in the furnaces of two boilers, and the waste gases being led into scrubbers through which is maintained a steady trickle of potash lye; the latter absorbs the CO_2, and is then passed into the boilers. Being heated here, the CO_2 is driven off, collected and passed to the compressing pumps, while the regenerated lye is passed back to the scrubbers to absorb a second charge of the gas. Such, in brief, is the cycle of operations; but to secure a pure product at a low working cost, certain precautions are necessary,

In the first place, coke generally contains some sulphur, which is burnt to SO_2; and if this were allowed to pass into the scrubbers the result would be that part of the potash would be converted into potassium sulphate, and its useful career as an absorbent of carbon dioxide ended. This loss of potash is in some works considerable, but at Old Ford has been almost eliminated by washing the crude gases as they come from the furnace, first with hot water and then with cold. The arrangement is shown in Figs. 1 and 2, in which the boilers for the lye are lettered A, A. The furnace gases are collected at the back of these boilers, and drawn by exhausters through a flue, b, into and through a scrubber, B, which is filled with fragments of marble or hard limestone, over which is maintained a constant flow of hot water from the tank, D. This water, it should be added, is heated by the carbonic acid gas, liberated from the lye boilers, which is passed through a series of pipes in this tank before going on to the gas-holder from which the

*Abstract of article in London "Engineering," October 21st, 1899.

compressing pumps draw their supply. The wash water, after flowing through the scrubber, is allowed to flow to waste. Behind this hot water scrubber is a cold water scrubber marked K J, in which the washing is repeated; but this time with a cold supply, and, leaving this, the now purified gases are passed to the absorbing towers, E, E, E. These towers contain fragments of broken coke supported on trays, and over this coke is maintained a constant trickle of lye from the tank, F, above. On reaching the top of these towers the remaining gases are directed off into the atmosphere. The lye is pumped to the tank at F from a second tank shown below at G. This tank is divided into two compartments, one of which has about four times the volume of the other. The larger compartment serves as a reservoir for the regenerated lye from the boiler, and it is from this that the pump feeding the upper tank, F, draws its supply. In the smaller compartment is collected the drain of enriched lye from the absorbing towers. An overflow is provided between this compartment and the larger one, so that in case of stoppage there is no loss of potash, the overflow simply being passed through the absorbing towers a second time. The enriched lye is not sent into the boilers direct, but passes first through an interchanger, which is shown at H, where it absorbs heat from the regenerated lye, leaving the boiler, D, for the absorbing towers. The latter is thus cooled and the former heated, and a considerable saving of heat is thus effected. From this interchanger the enriched lye passes into one of the boilers near the bottom, and thence to the other by a junction pipe, as shown. The pipe conveying the carbonic acid gas from the boilers to the gas holder, K, is fitted with a trap, which collects any liquid carried over. This trap discharges into the poor lye tank at G.

At Old Ford the lye boilers are of the Cornish type and measure 6 ft. 6 in. in diameter and 28 ft. long. They are, it will be seen, connected in series, this arrangement having been found advantageous, the decomposition of the bicarbonate of potash formed being then more completely effected. They are worked at a pressure of about 5 lbs. per square inch, but are very substantially built, being, in fact, strong enough for a working pressure of 50 lbs. per square inch. This excess of strength has been adopted mainly with a view to preventing leakage, as the joints have to be exceptionally good if the lye is to be kept in, this liquid being a solvent of iron rust. Similarly, it is impossible to use red lead in making the joints for different pipes, "Woodite" being used instead. The compressing pumps have been supplied by Messrs. J. & E. Hall of Dartford. They are of the three-stage vertical type, driven by belting by a horizontal engine of 20 nominal horse power. The three cylinders are surrounded by a water jacket, and the first-stage cylinder is double acting. In this cylinder the pressure is raised to 20 lbs. per square inch, and the gas is passed at this pressure into a purifier, in which any residual moisture is removed by means of calcium chloride. The second-stage cylinder is single acting and in this the pressure is raised to 125 lbs. per square inch. The discharge from this cylinder is passed through a series of cooling coils before being permitted to enter the third and final cylinder, which is also single acting. The water jackets for the cylinders and for the cooling coils are in series with each other. The pressure attained here is about 1,000 lbs. per square inch, but varies according to the outside temperature.

The specific gravity of liquid CO_2 varies from 0.9470 at 0° C., to 0.8266 at 20° C. At — 10° C. it is 0.9951.

The bottles used for CO_2 are all of identical capacity, each being capable of holding about 38 lbs. of water, and they are normally filled with 28 lbs. of CO_2, this figure being reduced, however, if the supply is intended for the tropics. The bottles, in fact, form one of the principal items of capital expenditure, since the demand for carbonic dioxide varies much with the season of the year. These bottles are tested with the similar care and with similar appliances to those worked out for Brin's Oxygen Company by Mr. K. S. Murray. The bottle to be tested is plunged in a cylinder of water, the joint between bottle and cylinder being made good by rubber packing. A water gauge fitted to this cylinder shows by the rise of level the expansion of the bottle under test; and any permanent set is indicated by this water-level failing to regain its original position on the removal of the test pressure. All the bottles are annealed at least every four years. For transport the tap of each bottle is protected by a malleable cast-iron cap, which, on removal, also serves as a key for opening or closing the tap. Till this precaution was adopted there were frequent cases of bottles in transport being interfered with by inquisitive passers by.

The Old Ford plant is believed to be the most nearly complete of any yet built and in operation. It is in duplicate, each section being capable of supplying 5 tons of liquid CO_2 per day. It was designed by H. Steinem and K. S. Murray, the company's manager and consulting engineer.

THE LIXIVIATION OF GOLD DEPOSITS BY VEGETATION.

Written for the Engineering and Mining Journal by Dr. E. E. Lungwitz.

The hypothesis that gold deposits may become impoverished by the leaching action of natural agencies has excited much discussion of late years. Many of our foremost engineers have taken a determined stand against it, basing their opinion upon the behavior of anorganic gold compounds and a thorough knowledge of the conditions existing in well explored gold mines. However, the opening up of new districts has furnished a number of observations that seemingly go to show that this interesting question is by no means as yet fully answered. This revives a discussion of the sixties: Is placer gold the product of mechanical or chemical concentration? This controversy has been deemed fully settled. It had been agreed that placer gold was always the product of mechanical concentration, though one had to admit that traces of chemical action had sometimes been noted. This, however, was thought to be restricted to the outcrops of the gold deposits, the gold of which had been dissolved during the period of oxidation and had again been reprecipitated.

At that time nobody ever thought that the presence of reagents which are able to dissolve gold must in time impoverish the deposit. Since the time that the price of silver declined and the search for gold took a corresponding start, the claim has been raised that certain outcrops have been leached and thereby impoverished, and that the unchanged deposits could only be found below the vadose water level. This claim has especially been advanced by Australian engineers, who even went to such extremes as to contend that an insignificant amount of gold in the outcrop of gold deposits was an unfailing sign of the presence of gold in paying quantities in the deeper parts of the same deposits. The observations which led up to this contention afford no direct proof. They refer, for instance, to the natural solvents of gold likely to occur in the neighborhood of lodes, such as chlorine, bromine, iodine, ferrous and ferric sulphate, bicarbonate of alkali accompanied by sulphuretted hydrogen and some others. Other circumstantial evidence was afforded by the apparent infiltration of gold into the country rock of lodes, the occurrence of gold in scales of microscopical size and of a modification similar to that in which it is usually obtained if precipitated from its solutions in the metallic state and some other minor observations.

Still, in my opinion, there are but two ways of proving incontestably the solubility of gold in agents contained in the surface water and the concomitant impoverishment of gold deposits:

1. Testing for gold in water taken from the vadose region, and
2. Proof that lodes improve with depth. This last is, however, hardly possible, since the general experience points to the reverse, and there is no explanation to account for the great irregularity in the distribution of gold throughout its deposits.

If gold ever exists in surface waters traversing a gold formation it is in but an extremely weak solution from which it is not easily reduced. For instance, sea water contains a minute quantity of gold to the ton, still this gold cannot be precipitated on sulphides of any kind or charcoal. Even stannous chloride is without effect on it. Since we do not know of any sea deposit of recent age or of any sea sludge containing gold, it is safe to conclude that organic matter in its manifold forms cannot reduce the gold from sea water. Gold has been found in the scale of boilers which were fed with mine water and in old discarded mine timbers, but the finding of gold under such conditions is no cogent proof of the gold having been in solution, since the silt suspended in mine waters has always been found to carry gold.

Dr. Don, I believe, was the first to scientifically examine mine water for dissolved gold, but his attempts to precipitate it on roughly powdered lead sulphide, ferrum hydrog. reductum and charcoal gave absolutely no results. From these results Dr. Don concludes that gold might possibly exist in a form which is not acted upon by the reagents used. Whoever has tried to filter off finely powdered quartz knows the impossibility of such a task. When we take into account the extreme delicacy of our dry tests for gold, we cannot blame Dr. Don for being inclined to attribute the gold rather to mechanical suspension than to solution in those cases where he actually observed it. Gold dissolved in surface waters, the existence of which is most likely, has never been proved beyond doubt.

I have had myself good reasons to be much interested in the same problem. I, too, have tried to solve it, and for a long time without result. In the following lines I intend to show the method by which I succeeded.

Vegetation in the neighborhood of smelting works and chemical factories is usually injured by flue dust or ingredients of the waste gases. Often, as in the case of brick kilns, the healthy growth of plant life is so little interefered with, that it takes long periods of activity on the part of these works before their destructive influence can be observed. In the latter case the chemist has no other way but to determine the excess of noxious elements in the diseased parts of plants over and above the local average which the corresponding healthy parts contain.

We assume, therefore, that if gold is dissolved by surface waters it ought to be found in trees, which are growing in the neighborhood of lodes or on placers. In a similar way we knew sea water to contain iodine before it ever was detected in it because this element was found concentrated in certain sea plants from which it was extracted on a large scale. In my investigation trees were felled and cut into pieces of convenient size. After this the bark was removed with about 1 in. of the outside wood. These pieces were placed upon a clean sheet of corrugated iron and fired. The ashes, which yet contained grains of charcoal, were collected and assayed.

For the assay at least 3 A. T. were used and to each crucible a small silver bead for the collection of the gold was added. The resulting buttons were then parted. In the first sample of wood ash I obtained, gold was undoubtedly present, but its quantity was so small that an estimation of its amount was out of the question. The reason was, as I found out later, that my workmen had taken it easy and had felled one of those rather rare soft wood trees. The next ones felled belonged to the so-called ironwoods, the ashes of which gave returns varying from $0.10 to $0.40 gold per ton. I am not a botanist and am not able to give here the scientific names of the trees; I know, though, that one tree which the Indians named "Ballemalle" contained $0.12 gold per ton in its ashes.

So far only the parts of the trunk near the roots had been used for these experiments. To see in which part of the tree the maximum of gold was to be found, the same experiments were carried out with larger parts of the branches, and here I obtained the most interesting results. These parts were richer in gold than all others previously tested. The increase was not everywhere the same, but the highest result I obtained was $1.17 per ton of ash. The percentage of ash in the wood of tropical trees has never been determined. I admit that I am sorry now not to have tested the roots too, but I omitted it for the sake of comfort and on account of the extreme tropical heat. But history holds out some consolation for me. About the same time that I carried out these experiments Mr. T. A. Rickard, the State Geologist of Colorado, spent some time in Australia and has examined roots that, in search of water, had penetrated to a depth of some 80 ft. for gold that might have been precipitated upon them. He did not find any and was satisfied; the researches of Dr. Don, since then published, explain how utterly impossible it is to see such an expectation ever realized.

Some, who have read of the terrific force of tropical storms, may feel

inclined to explain the presence of gold in trees by holding that during such storms the trees have been riddled with particles of ore that in time have grown into the wood. This explanation is obviously wrong. I was overtaken by thunderstorms, but with the exception of the noise of the elements, of breaking branches and of falling trees the lonesome wanderer feels little in the darkness of the primeval forest. But there are still better reasons. The bark as well as the wood of trees is formed from the same layer, i. e., the cambium. Therefore, before any particle could get into the wood in the suggested way, this piece of ore must pierce the bark and cambium. The facts that:

1. Gold is to be found in living trees growing on or in the neighborhood of a lode; and

2. That the greatest percentage of the gold is to be found in the branches, allow us to draw some very important conclusions. These are that:

A. Gold is dissolved by the surface waters traversing a gold formation.

B. That this solution is so extremely weak that nothing but the concentration effected by the osmotic action of millions of cell membranes is able to concentrate this solution sufficiently to precipitate the gold.

C. That the gold in this solution is in such a combination as to withstand the reducing action that untold numbers of cell membranes and cell contents must exert.

D. That this gold is probably not in anorganic combination and that the origin of this solution is not the barysphere the waters of which, according to accepted thories, are instrumental in the formation of our gold deposits.

What is this reagent capable of dissolving gold? At first I was inclined to believe that the decomposition of organic matter so plentiful in the tropics may have given rise to the formation of cyanide. But this assumption, however, must be abandoned for the following reasons:

1. Cyanide can only be produced from organic matter containing nitrogen at very high temperatures; and

2. The literature pertaining to the natural decomposition of organic matter does not record one observation that even traces of cyanide have been detected.

I can, therefore, do nothing better than leave the identification of this reagent to future researches. On this occasion, however, I call attention to the fact, entirely overlooked, that vegetation must be held responsible for the solubility of gold in surface waters.

We know that under these conditions which allow unimpeded action of air and moisture during the decomposition of organic matter converts the carbon into carbonic acid, the hydrogen into water and the sulphur into sulphuric acid. If nitrogen is present in organic matter it is set free as gas only under those conditions which favor putrefaction, but under those above specified, the nitrogen is at first converted into ammonia, which, however, is unstable and is rapidly oxidized to nitric acid. These reactions take place according to the following equations:

$$NH_3 + 3\,O = HNO_2 + H_2O$$
$$HNO_2 + O = HNO_3$$

That these reactions take place is proved by the following facts:

1. Ammonia is seldom met with in soils where moisture and air can freely circulate.

2. If to such soils ammonia is added, it rapidly disappears and is quantitatively converted into nitric acid.

This oxidation is intensified by heat and moisture, hence the time required for the oxidation and the completeness of the action are dependent on climatic conditions, and the amount of sulphuric acid and nitric acid generated is proportional to latitude and elevation above sea level. Sodium chloride is present everywhere and in connection with the sulphuric and nitric acid originating from organic matter gives rise to conditions such that the leaching of gold deposits is taking place wherever they are traversed by surface waters carrying these products of decomposition.

Since gold chloride, however, is easily reduced by organic matter, the presence of gold in trees growing on the outcrops of tropical gold deposits may be explained either by assuming that gold chloride in extremely weak solution obeys laws which differ from those we are accustomed to apply to solutions containing appreciable amounts of it, or that the gold chloride forms double salts with definite compounds of decomposition or with certain watery extracts, like such, for instance, to which we attribute the deep brown color of all tropical streams.

The observation that gold deposits may become impoverished was first noted in the tropics, but the remarkable influence of vegetation upon gold deposits is easily traced from a geological point of view. In which geological period organic life began on our earth is unknown. The first plants were seaweeds, such as fucoids and algaes, the remains of which were decomposed under the cover of sea-water, the element they were living in. The nitrogen contained in these plants was either liberated as gas or is still retained in the coal derived from them and exerted little influence on gold deposits. The vegetation upon land appears very much later, and its oldest fossil remains were found in the upper silurian series. This vegetation, however, needed an enormous time for its development, which it attained only during the carboniferous period. From this time a tropical climate prevailed from the equator to the poles until the beginning of the tertiary period. We conclude this from the fact that in the sediments of the intervening periods only such fossils have been found as have a character similar to that of plants living at present in the tropical zone. The tertiary period is characterized by differentiation of the climatic conditions, but a subtropical climate still prevailed during the middle of it in our latitude. Vegetation, therefore, exerted its greatest influence upon gold deposits during a time which began toward the end of the carboniferous period and lasted until the middle of the tertiary period. Since then this action has been practically restricted to the tropics. It is, therefore, not surprising and no coincidence that our present knowledge of fossil placers is limited to such as were in existence before plant life ever started or attained its maximum or to such as are imbedded in strata of tertiary origin. In the gravels, however, and sands of the quaternary era gold is so common that river deposits without it are rather the exception, and its association with implements of prehistoric man simply proves its late deposition.

Of fossil placers, whose age has been determined beyond doubt, I mention certain Archaean gneisses of Siberia, the Cambrian gold bearing cements of Deadwood Gulch in South Dakota, and the Devonian conglomerates of the Transvaal. Gold has been discovered in carboniferous sediments, but not in quantities of commercial value. Such deposits are known in New Zealand, near New Brunswick and in France. But all our efforts to find gold in strata of Dyassic, Triassic, Jurassic and Cretaceous age have signally failed. It puts in an appearance around the middle of the Tertiary period. The oldest of these placers are the deep leads of California, that owe their preservation to overflows of lavas, being thus protected at once from erosion and solution. It appears that gold in solution is not easily reduced, and we ought to conclude that placers are after all nothing but the accumulation of disintegrated fragments of older deposits. Though this may be true to a great extent it is not entirely in accord with other observations, which go to show that conditions exist favorable to its precipitation. This is evidenced by boulders of all those rocks to be met with in the neighborhood of such tropical placers, being partly coated with gold.

The interdependence existing between vegetation and gold deposits is not as easily demonstrated in the case of quartz reefs, since the fissures necessary for their formation are in their deeper parts exempt from lixiviation. The theories promulgated as to the age of quartz reefs are especially instructive. The famous English geologist, Murchison, defended the opinion that primary gold deposits of value were always of pre-devonian age. Later researches, however, proved that another period of activity in the formation of gold deposits began during the cretaceous period, and has continued up to the present day. Recent researches render it probable that gold deposits exist in almost all geological horizons. The facts, however, remain that all our productive mines, the age of which is known beyond doubt, are either of Paleozoic or of Tertiary age.

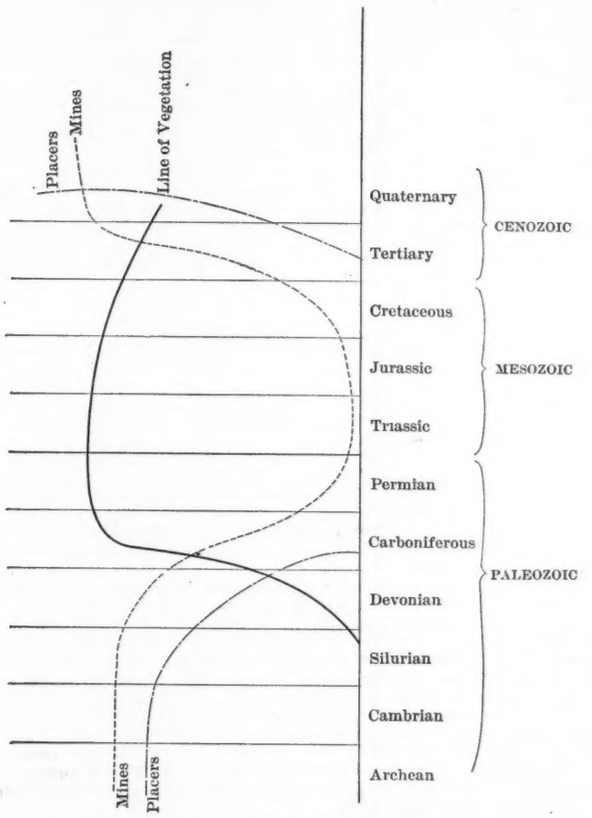


DIAGRAM OF PLACER DEPOSITS.

The relation that I have shown to exist between gold deposits and vegetation is best set forth in the accompanying diagram.

There is ample proof that in former geological periods the leaching of gold took place in the same way as at present in the tropics. Trees growing upon gold deposits contributed to the formation of coal measures, which now contain small but notable amounts of gold. The coal measures of Boksburg in the Heidelberg District in the Transvaal, and one in Wyoming, belong to this class. The gold contained in these coals was found by the assay of their cinders. In addition I mention that fossilized trees containing gold are often found.

It remains yet to be seen what has become of the gold that was dissolved during the mesozoic era. If, according to the theory of Kant-Laplace, our planet was at one time a ball of white hot gases then we can but conclude that the first accumulations of condensed water were free of gold. Eminent mining engineers have asserted that the paleozoic seas contained more gold in solution than our present oceans, but there is proof to the contrary. When sea-water evaporates the first salts to crystalize are sodium chloride and gypsum and only toward the end the more soluble potash, calcium and magnesia salts. Such residuary salts form layers of great value and one of them is mined at Stassfurt.

Though I am not aware of any special investigation having ever been carried out with such potash salts with a view of detecting gold in them, still gold has never been mentioned as one of its rare constituents. Anyway the characteristic properties of gold salts must have prevented its being overlooked. We may take it, therefore, for granted, that these potash salts of Stassfurt are free from gold, and since this deposit is of dyassic age the ocean itself at this time did not contain any gold. This is not to be wondered at as vegetation had just begun in the foregoing period to exert its influence upon gold deposits.

However, I venture to predict that gold will be found in potash salt deposits of Tertiary age, such, for instance, as those of Kaluer, in Galicia, Austria.

ABSTRACTS OF OFFICIAL REPORTS.

Aetna Consolidated Quicksilver Mining Company, California.

This company owns 350.48 acres land and 578.32 acres mining claims, with reduction works at Lidell, Cal. The capital stock is $500,000. The report is for the year ending December 31st, 1899. The total receipts from sales of quicksilver were $154,552; interest, $696; total, $155,248. The total expenses—including $2,679 for repairs and construction, and $2,366 for depreciation—were $86,190, leaving net earnings of $69,058. Dividends paid were $50,000, or 10 per cent., leaving a surplus of $19,058. Adding balance of $56,532, brought over from previous year, made the total surplus at close of year $75,590.

The mining statement is as follows:

	1898.	1899.	Changes.
Tons ore smelted	18,394	18,084	D. 310
Quicksilver producer, flasks	3,450	3,800	I. 350
Quicksilver produced, lbs	263,925	290,700	I. 26,775
Per cent. of metal obtained	0.72	0.80	I. 0.08
Drifts and tunnels run, feet	2,385	2,740	I. 355

The receipts were $8.58 per ton smelted; the expenses $4.76, and the profit $3.82.

The report says: "Operations during 1899 have given good results. The Silver Bow ore-body, which has heretofore yielded the bulk of our ore, has been largely worked out to the ninth level, leaving a comparatively small amount of ore in the upper levels; but we are now sinking below the ninth level, endeavoring to trace the ore body down. The ore shoot opened up by the Washington shaft holds well, and shows a good ore-body so far, and we are prospecting and developing at the 200 level with good indications of its continuance. We are also run ning two new prospecting tunnels in Washington ground. Quicksilver is in good demand, with light stock and strong prices, which have every appearance of holding the coming year."

Mysore Gold Mining Company, India.

The report of the Mysore Gold Mining Company, Limited, the premier gold mine of the Colar District, India, for the year 1899, shows that the total profit was not so great as in the year before. The dividends on £250,000 capital since 1896 have been at the rate of 100 per cent. for 1896, of 110 per cent. for 1897, and 150 per cent. for 1898, while that for 1899 has fallen back to 140 per cent. This halt in the progress of the mine is more apparent than real, as will be seen by looking through the various facts and figures of the report. In the first place the production for 1898 was swelled by an extra 6,667 oz. valued at about £26,000, which was obtained on the dismantling of the old mills and tailings plant. Secondly much difficulty has been experienced in keeping the plant running owing to the scarcity of labor, so many of the usual native workmen being either down with the plague or absent from fear of the infection. Thirdly, the average content of the ore milled has been slightly lower than formerly, and though 30 new stamps were brought into use during the latter end of the year the actual amount of gold produced from the stamps was rather less than that produced in 1898. The new tailings plant was put in operation in August and the production from tailings was greater than in 1898. With a larger plant the selection of ore is not conducted with such nicety, and the reduction in the yield in the present case is not to be attributed to any falling off in the value of the mine. When the new stamps and cyanide plant are in regular operation and the supply of labor plentiful, the yield and profit are sure to advance. The directors report that the mine continues to develop well and that the ore reserves have been increased by 45,000 tons and now stands at 196,000 tons.

During 1899 the total amount of gold extracted was 155,786 oz. crude, equal to 156,128 oz. standard (.925 fine) or to 144,418 oz. fine gold, and valued at £606,947. The battery yield was 146,466 oz. crude, obtained from 92,343 tons of quartz, being an average of 1.59 oz. per ton. From the cyanide plant 9,320 oz. crude were obtained from 81,560 tons of tailings, being an extraction of 0.11 oz. per ton. The figures for the output of battery and cyanide plant are only given in crude ounces and their fineness and value are not stated, this information only being given for the total of the two. After paying for costs of working, the profit available was £406,207, out of which dividends amounting to £350,000 have been paid, while £30,000 was placed to reserve, which now amounts to £154,300. The sum of £51,306 was spent on capital account during the year, chiefly for new buildings and additions to machinery in plant. Thirty new stamps have been added during the year, and the new cyanide plant, capable of treating 10,000 tons a month, has been brought into operation.

Barrow Hematite Steel Company, Great Britain.

The report of the Barrow Company of Barrow-in-Furness, England, for 1899, has just been issued. In December last our London correspondent drew attention to the state of this company and pointed out that the properties are being exhausted and that the management is not so progressive as is necessary nowadays. A proposition has been made by the directors to write down the capital by one-half, but owing to the opposition of shareholders this rearrangement has not yet been carried out.

The balance sheet for 1899 shows that a net profit of £117,022 has been made. Out of this a sum of £10,603 goes for extensions and improvements and £28,003 for interest on debentures. With £10,418 brought forward from last year, there remains a sum of £88,834 available for distribution as dividends on the ordinary and preference shares, but owing to the deadlock in the matter of writing down the capital the directors do not propose to distribute any dividends at present. Perhaps this action may help to coerce the recalcitrants. The capital of the company is £1,125,000 in ordinary shares, £28,275 in preference shares entitled to 8 per cent. dividend, and £375,000 preference shares entitled to 6 per cent. dividend, while the debentures amount to £550,000, bearing 5 per cent. interest. The fortunes of the company have been very variable. For instance, in 1890 and 1891 the ordinary shares only got 2½ per cent., while in 1892 and 1893 they got nothing at all. In 1894 and 1895 not only did the ordinary shareholders get nothing, but the preference suffered in the same way. In 1896 the profits were sufficient to pay the overdue preference dividends for 1894 and 1895 and to provide a preference dividend for 1896. In 1897 the net profits after paying debenture interest were £55,000, which provided only part of the preference dividend. The profits in 1898, after paying debenture interest, were £65,800, which left shareholders in much the same state. The year 1899, as has been already mentioned, showed a profit, after providing debenture interest, of £88,834, the ultimate destination of which is still uncertain. This amount would provide £24,762 for preference dividend, but if due allowance was made for depreciation, special expenditure, balance forward and reserve, there would be hardly anything left for ordinary shareholders. In a year when other similar companies in England have been flourishing, it is a pity to see the Barrow Company in such low water.

The directors report that the steel works have been efficiently maintained and that they have been in full employment. An additional Siemens furnace has been added and two out-of-date blast furnaces dismantled. A complete installation of electric light has been brought into operation at the iron and steel works and arrangements are being made to use electric motors for working some of the auxiliary machinery. By-product coke ovens have been erected, and some of them are already in operation. The iron ore properties belonging to the company in the district have yielded less ore than ever and efforts are being made to find new deposits. A considerable proportion of the ore now used is imported from Spain and elsewhere. We believe there are still large deposits of hematite ore in the Furness District, and in Cumberland that are either unworked or only worked in an old-fashioned manner. Local conditions, vested interests and ground landlords all militate against their proper development and it is cheaper to get the ore from regions where such hampering circumstances do not exist.

MINERAL PRODUCTION OF GERMANY.

From the advance statements of the mineral production of the German Empire in 1899, which are published by "Gluckauf" in a recent issue, we give the following table showing the ores and other minerals produced by the mines. The figures are in metric tons:

	1898.	1899.	Changes.
Coal	96,309,652	101,621,866	I. 5,312,214
Brown coal (lignite)	31,648,898	34,202,561	I. 2,553,663
Total coal	127,958,550	135,824,427	I. 7,865,877
Asphalt	67,649	74,770	I. 7,121
Petroleum	25,989	27,027	I. 1,038
Rock salt	807,792	861,123	I. 53,331
Kainit	1,103,643	1,108,154	I. 4,511
Other potash salts	1,105,212	1,392,247	I. 287,035
Iron ore	15,901,263	17,989,665	I. 2,088,402
Zinc ore	641,706	664,536	I. 22,830
Lead ore	149,311	144,370	D. 4,941
Copper ore	702,781	733,619	I. 30,838
Gold and silver ores	14,702	13,506	D. 1,196
Cobalt, nickel and bismuth ores	3,157	1,270	D. 1,887
Manganese ore	43,354	61,329	I. 17,975
Pyrites	136,849	144,602	I. 7,753

Increases are shown in all the important minerals with the exception of lead ore. The gain in coal was 6.2 per cent., and in iron ore mined 13 per cent.

The production of metals from the ores mined, and also from ores imported, was as follows, in kilograms and metric tons:

		1898.	1899.	Changes.
Gold	Kgs.	2,847	2,605	D. 242
Silver	"	480,578	467,593	D. 12,975
Quicksilver	"	4,182	2,657	D. 1,525
Copper, fine	Tons.	30,695	34,626	I. 3,931
Copper, black	"	62	103	I. 41
Lead, pig	"	132,742	129,225	D. 3,517
" litharge	"	3,857	3,562	D. 295
Zinc or spelter	"	154,867	153,155	D. 1,712
Nickel and nickel salts	"	1,692	1,747	I. 55
Antimony and manganese	"	2,711	3,149	I. 438
Arsenic and arsenic products	"	2,679	2,423	D. 256
Tin	"	993	1,481	I. 488
Sulphuric acid	"	772,595	837,839	I. 65,244

The nickel salts include also bismuth and uranium salts. The tin is metal recovered from scrap, old plate, etc. The sulphuric acid last year included 813,141 tons ordinary acid, 19,526 concentrated acid, and 5,142 tons copper sulphate. The pig iron production has already been reported. It was 8,029,305 tons in 1899, and 7,402,717 tons in 1898, showing an increase of 626,588 tons last year.

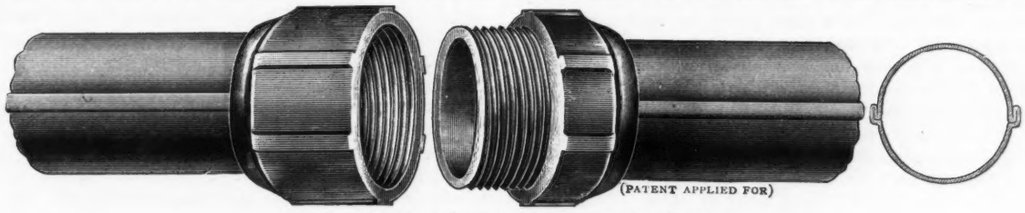
The production of salts from solution in the various works was as follows, in metric tons:

	1898.	1899.	Changes.
Common salt	565,683	571,104	I. 5,421
Aluminum sulphate	35,366	37,693	I. 2,327
Glauber salts	69,111	69,216	I. 105
Potassium chloride	191,347	207,506	I. 16,159
Potassium sulphate	18,853	26,103	I. 7,250
Potassium-magnesium sulphate	13,982	9,765	D. 4,217
Magnesium sulphate	30,295	39,540	I. 9,245

Other minor products not given in the table, but reaching some 500,000 marks in total value, included graphite, kiesert, borax, tin ore, uranium ore, tungsten ore, alum ores, iron pyrites, sulphur, cadmium, alum and magnesium chloride.

LOW PRESSURE PIPE.

The Statler-Bischoff Company, Chicago, has recently placed on the market a new water piper capable of doing advantageous work in many lines such as for pumps, oil, irrigating, mining, etc. The pipe is made of the best cold-rolled steel and galvanized after it is made. The connections are simple and are made to fit any standard pipe fittings. They are so made that the couplings allow a flow the full size of the pipe. The pipe will stand a pressure of 200 lbs., and being light gauge it costs less than wrought iron pipe of the same size. The pipe is manufactured in sizes 1 in., 1¼ in., 1½ in. and 2 in. About 200,000 ft. of this pipe has recently been furnished for the boiler circulating tubes of the new Russian naval vessels the "Variag" and "Retvizan," and the new United States battleship "Maine."

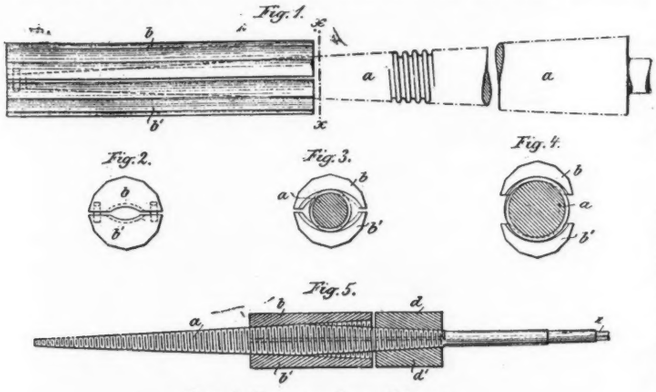


STATLER-BISCHOFF LOW-PRESSURE PIPE.

A NEW COAL WEDGE.

The accompanying illustration shows the new Hay & Voiseux coal wedge, which is being introduced in Germany. The "Allgemeine Bergmannische Zeitschrift" says that the wedge consists chiefly of the conical steel screw a, fitted with a handle, e, for turning, and a split nut, b b^1. Fig. 1 is a front view of the tool; Figs. 2 and 3 show different cross-sections of the split nut at the moment the tool is being inserted in a hole previously bored in the mass of coal; Fig. 4 shows the position of the nut when the screw has advanced a certain distance; while Fig. 5 represents a screw, tapered in both directions and preferably in such a manner that the point of greatest thickness is a little way behind the center of the length. If, when this screw has been driven up to its thickest part, the coal refuses to split, the screw and nut can be withdrawn and the latter replaced by another split nut, d d^1, which, on the screw being again driven home, exerts a greater pressure on the walls of the borehole than could be obtained with the nut first used.

According to the circumstances of each case the length of the screw



HAY & VOISEUX COAL WEDGE.

and its shank, and the thread and diameter of the screw, may be of various dimensions. For instance, the thread may be cut triangular, square or round, the latter being preferable as the least liable to injury; the turn of the thread may also be right or left-handed.

To set the wedge ready for use the split nut, b b_1, is placed on the thin end of the tapering screw, as shown in Figs. 1 and 2, the two together being then inserted in the borehole, which the nut should just about fit. The screw is next screwed up by hand as far as it will go, a wrench or some other form of leverage being employed to drive it home. The effect being to drive the two halves of the split nut apart, the latter, consequently act the part of a wedge and rive the coal. As their outward movement is only gradual, the nature of the fissure produced is under control, since the slower the pressure is exerted the fewer and more extensive are the cracks formed; consequently the coal can be split off in large blocks with a minimum of small coal.

RAILROADS IN NORTH CHINA.—A report from United States Minister Conger at Pekin says: "The Tientsin-Shanhaikuan-Niuchwang branch of the Chinese Imperial Railway is now completed and will soon be opened to general traffic. The distance from Tientsin to Niuchwang is 348.6 English miles. The line from Tientsin to Chinchow, 268.6 English miles, over which trains have been running for some months, is said to pay 14 per cent. on the whole capital invested. It is expected that when the entire line is open, the road will pay a return of 30 per cent."

RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

Specially Reported for the Engineering and Mining Journal.

RIGHTS GROWING OUT OF "BLIND LEADS" IN TUNNELS.—Under the laws of the United States (Revised Statutes, section 2322) which provide that the locators of all mining claims on any mineral vein where no adverse claim exists on the 10th day of May, 1872, "shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes and ledges throughout their entire depth, the top or apex of which lines inside of such surface lines, extended downward vertically, although such veins, lodes or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations" and Section 2,323 of the same law, which provides that "where a tunnel is run for . . . the discovery of mines, the owners . . . shall have the right of possession of all veins or lodes within 3,000 ft. from the face of such tunnel on the line thereof, not previously known to exist, discovered in such tunnel, to the same extent as if discovered from the surface, and locations on the lines of such tunnels of veins or lodes not appearing on the surface, made by the parties after the commencement of the tunnel, and while the same is being prosecuted . . . shall be invalid," blind leads, discovered while projecting a discovery tunnel through a prior valid subsisting claim, cannot be claimed by the owners of such tunnel. And, Section 2,336, of the same law, which provides that "where two or more veins intersect or cross each other, priority of title shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of intersection; but the subsequent location shall have the right of way through the space of intersection for the purposes of conveniently working the mine," the space intersecting in determining the ownership of the ore within such space, where the claims cross and intersect on the strike of the lode, means the intersection of the claims, and not merely the veins.—Calhoun Gold Mining Company vs. Ajax Gold Mining Company (59 Pacific Reporter, 607); Supreme Court of Colorado.

MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid; we cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

115.—Crystal Growths from the Mammoth Cave.—At the last meeting of the Section of Geology and Mineralogy of the New York Academy of Science, some peculiar features of the Mammoth Cave in Kentucky were discussed. It was stated that the cave was in a bed of sub-carboniferous limestone, some 400 ft. thick, which is capped by the Chester sandstone. The present water level is that of the Green River. The crystal growths found in the cavern are calcium carbonate, calcium sulphate and magnesium sulphate. The stalactites of calcium carbonate show frequently the crystalline structure of aragonite. This crystalline structure is often shown by projections on the surface of the stalactite due to external growth from deposition on some crystalline point. The gypsum growths are of more interest since they are found only in the upper series of chambers in the cavern and have been shown by exact measurement to be connected with sink holes on the surface. In one case a passage 40 ft. wide and 4 or 5 miles long is partly filled with gypsum growths that have fallen from the roof. These growths are of two classes, crystalline and botryoidal; both are often extremely beautiful. The crystalline growths are frequently of fantastic shape, the crystals growing in apparent disregard of gravity, in curved, recurved and plumose shapes, resembling sometimes a huge rosette. The source of the sulphuric acid forming the sulphate of lime is uncertain. It was suggested that it might be of vegetable origin, inasmuch as the gypsum deposits are always near the surface. But as the great limestone bed itself has not been analyzed carefully at a number of points, there is a possibility that thin seams of gypsum may occur in it or it may carry a small per cent. of free sulphur. The magnesium sulphate forms light flocculent masses of crystals on the roofs of a few of the upper chambers. These when heated by holding a torch beneath them fall in fine crystals forming the "snow storms," so-called by the guides. One of the necessary pre-existing conditions for the formation of caverns and growth of stalactites and stalagmites in a limestone formation was stated to be a luxuriant vegetable growth to furnish the necessary car-

bonic acid for dissolving the limestone. It was pointed out, however, that there are extensive caverns with stalactites in the Bermudas where there was no soil until recently and consequently, no vegetation, and also in certain of the West India islands which have a very arid climate.

116.—Rhodochrosite.—According to a Denver paper the finest specimen of rhodochrosite ever taken out of a Colorado mine was brought to Denver recently by Thomas Doyle of Ouray, Colo., by whom it was taken out of the 700-ft. level of the Grizzly Bear Mine in Ouray District. Rhodochrosite is a carbonate of manganese, which crystallizes in hexagonal form, the crystals being of a delicate rose color. Perfect crystals are rather rare, and bring good prices as cabinet specimens. Mr. Doyle's specimen has between 40 and 50 perfect crystals, some of which are more than one inch long. A streak of native silver runs through the mass, and the entire mass will run between two and three ounces in gold. The specimen has been mounted in a satin-lined case to be sent to the Paris Exposition. Armstrong & Hurlburt, owners of the Grizzly Bear Mine, consented to take charge of it for Mr. Doyle, who thinks that it will be coveted by European collectors of rare minerals. Single crystals, when perfect, frequently bring $5 each.

117.—Sapphires.—Variously colored sapphires of good quality have been taken from a new locality on Clear Creek in Granite county, Montana.

118.—C. J. K.—Monazite.—The greyish powder with shiny flakes is not monazite at all, but is probably a decomposed mica, and may be classified as sericite. Monazite, a phosphate of several rare earths, is of wide occurrence and is generally found in small crystals in metamorphic rocks, such as gneisses. It occurs on a commercial scale in Brazil and in the Southern Appalachians. It is obtained from stream or beach sands in small yellowish to reddish brown grains associated with grains of garnet, magnetite and rutile.

119.—S. E. T.—Green Schist.—The greenish rock you send probably contains no copper. It was, apparently, a hornblende schist full of garnets. The hornblende has now largely changed to chlorite and the garnet crystals have also changed; they contain a micaeous mineral.

120.—W. S. L.—The specimens you send are so small as to make classification difficult in some cases. No. 1, chiefly calcium carbonate, a dark crystalline limestone or marble; No. 2, is a crystal of quartz; No. 3, is principally blende, zinc sulphide; No. 4 is a mixture, the brownish streak is principally calcite, the white and blueish mineral is fluorite, calcium fluoride; No. 5 is a brown iron ore—limonite; No. 6 is a crystal of fluorite; No. 7 is mostly zinc blende; No. 8 is a mixture of galena and blende, lead and zinc sulphide. Most of the specimen is zinc sulphide; No. 9 is iron ore, limonite, like No. 5; No. 10 is undeterminable; No. 11 contains calcite, calcium carbonate, the white mineral and sphalerite or zinc blende the brown mineral; No. 12 may be part of what was a nodule of chert; No. 13 is an iron ore, is much like 5 and 9, but is more crystalline and contains a little hematite.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Hardening Copper.—Is it true, as stated in many newspapers, that a process for hardening copper has lately been discovered?—O. R. P.

Answer.—It is not true. Such reports are circulated from time to time, but are not based on any solid facts. Hammering hardens copper to a certain extent, as is well known; but no other process has been discovered. There are, however, certain alloys of copper which are much harder than the pure metal.

Treating Pyritic Ores.—1. Is there any known concentrator that would concentrate all the values of auriferous sulphurets, such, for example, as the enclosed sample? 2. What is the best treatment for such ores, its approximate cost and average loss in values?—W. H. C.

Answer.—There is always some percentage of loss in concentration. The amount varies with the nature of the ore, the condition of the machinery used, the machines themselves and other factors. No machine has ever been invented or made which could reach absolute perfection in working. In many cases, however, the saving is carried up to a high proportion.

As to the best treatment for your ores you should consult a competent mining engineer or metallurgist. As to cost, it will depend not only on the nature of the ores, but on location and local conditions, water supply and other elements. No estimate could be given without a proper examination.

Copper Converters.—What is the usual size of the converters used on copper matte?—D. S. O.

Answer.—Hixon—"Notes on Lead and Copper Smelting and Copper Converting"—says: "It has been the experience of the writer that very large converters do not do as good work on high-grade matte as smaller ones, while on low-grade mattes they do much better. The extremes of size thus far in use are: Parrot, 58 in. diameter by 8 ft. 6 in. high; Aguas Calientes, 96 in. diameter by 16 ft. high. The main objection to large converters on high-grade matte is that the slag is very frequently granulated and cannot be poured off, while with the smaller converters no such difficulty is experienced; in fact, at Anaconda the trouble was to get the matte high enough in grade so that the linings would last 6 or 7 changes. As the size of the vessel increases, the thickness of the lining also increases rapidly, and since it is very porous, the loss of blast through the lining also increases. A point would soon be reached where, with increased thickness of lining, the decreased efficiency of the blast would more than counterbalance all the benefits of large vessels."

IRON IN SWITZERLAND.—Iron ore was discovered a number of years ago at Hasliburg and Urdachthal in the Bernese Oberland, but the deposits have never been worked to any extent. Analyses of ore from Urdachthal have shown 60 per cent. of metallic iron. It is now proposed to mine these ores on a large scale, and a wire tramway is to be built to carry the ore to the railroad station of Inners Rivchen. A concession has been granted to the Mueller-Landsmann, who has also obtained water rights which will, it is estimated, furnish 60,000 H. P. It is proposed to smelt the ores by electricity, but nothing has been made public as to the process to be used.

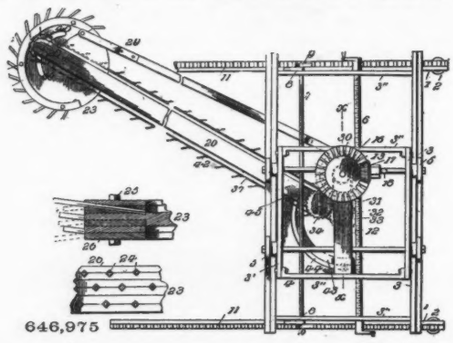
PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending April 10th, 1900.

646,975. COAL MINING MACHINE. Thomas M. Gallaher, Bellaire, Ohio. The combination of a frame, a carrier having one end pivoted on said frame, a cutter-head mounted on a shaft near the extremity of the outer end of the carrier, a sprocket-wheel mounted on a shaft on the outer end of said carrier beyond the shaft of the cutter-



646,975

head, a second sprocket-wheel mounted on the inner end of the carrier, a clearing-chain working independently of the cutter-head and means for giving motion to the second sprocket-wheel.

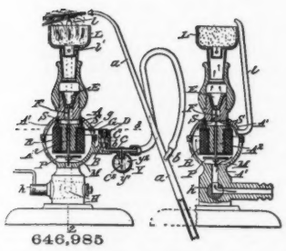
646,985. BLOWPIPE LAMP. Johann Heinz, Pforzheim, Germany. In blowpipe lamps, a gas-valve, and an armature connected thereto, an electro-magnet and a make-and-break connection arranged in the circuit of said electro-magnet, in combination with a blowpipe and a blast-pipe communicating therewith, an air cylinder communicating with the latter, and a movable member for closing off the air cylinder behind the make-and-break connection, whereby the circuit of the electro-magnet is closed whenever air is forced through the blowpipe.

647,000. HYDRAULIC RAM. James M. Kline, Beavertown, Pa. The combination with a fixed lug, of a spring support fastened adjustably to said lug, a valve-stem connected adjustably to the spring support for adjustment therewith and for adjustment thereon independently of the spring adjustment on the supporting-lug, and a relief-valve clamped to said stem, said spring support adjusted to normally hold the relief-valve in an open position.

647,011. AMALGAMATOR. Albert L. Malone and Hiram Terwilliger, Portland, Ore. The combination with a mercury holder having a closed and internally-concaved bottom, and provided with a detachable cap-plate having a boss, of a horizontal flat sieve extending entirely across the interior of said mercury holder; a vertically movable rod secured to said sieve and projecting upward therefrom and through said boss, and provided with a handle; a holding device carried by said boss and located to engage the rod to thereby hold the same and the sieve in adjusted vertical positions; a feed-pipe the lower end of which is disposed below said sieve; a second and similarly inclined pipe telescopic in said first mentioned pipe, and having its lower end disposed below the sieve, and its lower edge being horizontally disposed; and a set-screw carried by the first mentioned pipe and serving to engage and hold the telescopic pipe.

647,021. PORTABLE TOOL FOR WORKING STONE, ETC. John O'Rourke, Salem, Mass. The combination with a longitudinally-slotted chuck-shaft, a spring-actuated spindle having a key at one end adapted to have sliding connection in the slots of the chuck-shaft and said spindle having cams on one end, of a pair of tubular parts inclosing the chuck-shaft and spindle and screwed together whereby the tool may be lengthened or shortened and the tension of the spring regulated, one tube having ball-bearings to receive the thrust of the chuck-shaft and the other tube having a cam therein which co-operates with the cam on the spindle to give a sudden smart endwise impulse to said spindle.

647,057. STAMPER BATTERY. Marinus Weber, Adelaide, South Australia. A stamper battery consisting of a supporting frame, a hammer-wheel composed of a multiple of circular plates connected by bolts, a multiple of swinging hammers hung on the bolts and means for applying power to the wheel in combination with a stamper-box of



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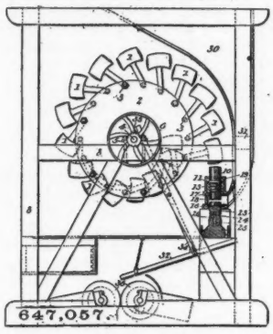

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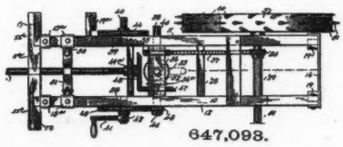
two compartments having apertures, disconnected stampers mounted in the apertures, means for raising the stampers, oscillating anvil-blocks, a hopper supplying ore to the anvil-blocks and a pair of crushing rollers below.

647,087. ROLLING MILL. William Garrett, Cleveland, Ohio, assignor of one-half to John C. Cromwell, same place. A mill comprising lines of rolls, the middle rolls of the three lines being geared together and rotatable at the same speed, the end rolls also geared together, and the end rolls of the third line being driven independently of the rolls of the other two lines.

647,085. SECONDARY BATTERY. Harold S. Gladstone, London, England. An electrode for secondary batteries consisting of a flattened envelope of perforated sheet-lead, a mass of active material inclosed by said envelope, and a central core embedded in the active material and consisting of a strip of perforated sheet-lead having end lugs of lead which serve as distance pieces.

647,093. MINING AND CUTTING MACHINE. John W. Hayes, Elk Garden, W. Va., assignor of one-half to Thomas W. Ashby, same place. The combination with a frame, of a carriage slidably fitted thereto, a cutter-shaft mounted in the front end of said carriage, a revoluble cutter mounted upon the cutter-shaft and adapted for engagement with the ends thereof interchangeably, a transverse counter-shaft arranged parallel to the cutter-shaft and journaled in the rear



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end of the carriage, whereby the two shafts are held in the same relation at all times, sprocket-gearing between the counter-shaft and the cutter-shaft, a rearwardly-extending feed-screw movable with the slidable carriage and geared to the counter-shaft, a cross-bar fixed to the frame beyond the limit of rearward travel of the carriage, a feed-nut supported by said cross-bar in fixed relation to the frame and receiving the feed-screw, and means for driving the counter-shaft to rotate the feed-screw and the cutter-shaft.

647,144. OIL WELL PUMPING JACK. Willie W. Mercer and Quincy A. Mercer, Bowling Green, Ohio. The combination with a well-casing, well-tube, and a plunger-rod, of two sets of toggle-links connected by knuckle-joints and pivotally coupled at their upper and lower ends respectively to the plunger-rod and well-tube.

647,149. HOT-BLAST STOVE. George W. McClure, Pittsburg, Pa. A hot-blast stove having a central or initial first pass, an annular second pass surrounding the first pass, and an annular third pass surrounding the second pass, said second pass having a greater amount of heating surface than the third pass.

647,150. LADLE-CAR. Marvin A. Neeland, Youngstown, Ohio. A ladle-car having a tilting and rolling ladle thereon, said ladle having trunnions and a tipping mechanism movable in the plane of the trunnion, and acting thereon, said mechanism being arranged to allow the removal of the ladle without disturbing or changing the tipping mechanism.

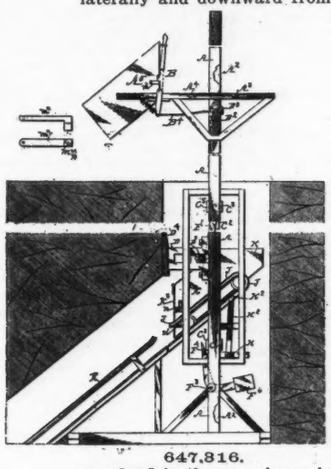
647,201. APPARATUS FOR PRODUCING TAPERED BARS. John T. Rowley, Beaver Falls, Pa. In an apparatus for rolling tapered bars or rods of gradually-varying circular cross-section, a pair of rolls having two pairs of grooves, two grooves in each roll, those of each pair being in opposition to each other, each groove of the first pair being at its operative center longitudinally, wider on lines parallel to the axis of the rolls than at the ends of the operative parts, and shallower on lines radial to the rolls at the said central operative line than at the end line.

647,217. ELECTROLYZING APPARATUS. Antoine J. O. Chalandre, Louis J. B. A. Colas and Charles J. Gerard, Paris, France. The combination with the cathode and anode compartments of an electrolyzing apparatus, of a receiver for collecting the gases liberated in the cathode compartment, a mixing chamber, a pipe or passage leading from the receiver to said mixing-chamber, a pipe or passage leading from the anode compartment to the mixing-chamber, and a pipe or passage leading from the mixing-chamber back into the electrolyzing apparatus, whereby the electrolyte therein may be recharged with the gases in their combined state to prevent secondard reactions in said apparatus.

647,250. ELECTRIC METAL-WORKING APPARATUS. Charles L. Coffin, Detroit, Mich. The combination with the frame, of a multiple of pairs of clamps arranged at different points on the frame and a movable electrical furnace adapted to be moved into heating relation to each clamp or to a position between the clamps.

647,295. MATERIAL FOR PURIFYING ACETYLENE GAS. Otto Ernst and Alfred Phillips, Hochst-on-the-Main, Germany. A material consisting of a solid, highly-porous material containing a salt of hypochlorous acid, and capable of remaining porous and effective under the influence of moisture.

647,316. APPARATUS FOR ELEVATING ORE FROM MINES. Robert P. Mulock and Harry W. Wood, Colfax, Iowa. A cage slidingly connected with parallel uprights in a shaft, a fixed track extending laterally and downward from the shaft, a track for supporting a



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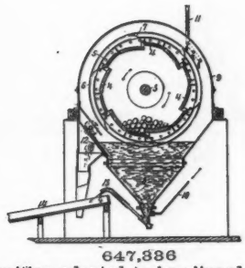


647,336

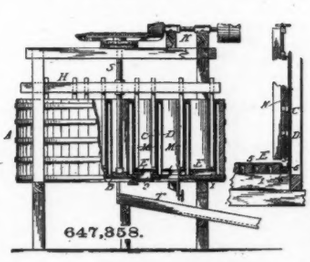
car fixed in the cage in an inclined position adapted to be aligned with the said fixed track inclined laterally and downwardly from the shaft and means for raising and lowering the cage.

647,320. PROCESS OF MAKING STRONTIA. Spencer B. Newberry, Sandusky, Ohio. The method of manufacturing stontia from stontium sulphate, which consists in mixing stontium sulphate with the oxide of an alkaline earth, and calcining the mixture at a high temperature.

647,336. BALL GRINDING-MILL. Henry L. Sulman, London, England, assignor to Fried. Krupp, Magdeburg-Buckau, Germany. A mill comprising a casing having a lower part providing a water-trough, the ball-drum having grinding-plates and inner and outer concentric sieves and tangential return-plates extending from the outer sieve through the inner sieve to the grinding-plates, a series of nozzles for spraying water on the periphery of the outer sieve in advance of the return-plates and means whereby the level of the water in the trough and the immersion of the sieves at the bottom of the drum are determined.

647,348. WELL-DRILLING MACHINE. Friedrich R. Wiedner, Cibolo, Tex. The combination with the drill-rod, of a pinion mounted thereon, a gear intermittently meshing with said pinion to rotate it in one direction, means for rotating said gear, and means for rotating said pinion in the opposite direction when not in mesh with said gear.

647,358. LEACHING TANK. Daniel W. Bacon, San Francisco. A tank having a bottom, a leaching false bottom above the same, and vertical filtering partitions arranged in pairs within the tank, whereby



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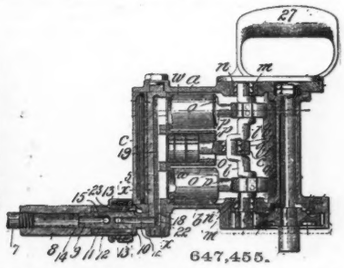

647,455.

spaces are left between pairs of partitions, and other spaces are left between members of such pairs, said spaces last named all communicating with the chamber between the bottom and false bottom.

647,420. PROCESS OF INCREASING STABILITY OF NITROCELLULOSE. Alfred Luck, Dartford, and Charles F. Cross, London, England. The process consists in freeing the nitrocellulose from the nitrating acid, treating it with a solution of acetone and metallic salts, and alcohol, and washing the nitrocellulose, in successive washes to remove the acetone.

647,428. PROCESS OF FIREPROOFING WOOD. Julius Schenkel, Dortmund, Germany. The process consists in subjecting the wood directly and at ordinary temperatures to a strong solution of calcium chloride and lime, in the absence of any material tending to decompose the lime.

647,455. PNEUMATIC DRILL. Edward C. Meissner, St. Louis, Mo., assignor to the Standard Railway Equipment Company, East St. Louis, Ill. The combination with a casing, of a spindle fixed therein and provided with inlet and exhaust ports, cylinders mounted on said spindle, pistons in said cylinders, a crank-shaft with which said pistons engage, a plug mounted on the end of the spindle and provided with ports in registration with the inlet and exhaust ports of said spindle, and a rotary valve co-operating with said plug to control the admission of pressure to, and exhaust from the spindle-ports.

GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy.

Week Ending March 17th, 1900.

4,121 of 1899. LIGHTING MINERS' LAMPS. W. Best, Leeds. Improved form of apparatus for lighting miners' oil lamps by an electric spark.

8,043 of 1899. TIN EXTRACTION FROM ORES. G. de Bechi, Paris, France. Method of extracting tin from complex ores by roasting, then leaching with hydrochloric acid, and treating the residue with caustic soda to obtain sodium stannate.

8,125 of 1899. OPEN-HEARTH FURNACE. A. Tropenas, Paris, France. Application of the inventor's process for decarbonizing iron to the open-hearth process.

9,393 of 1899. COKE DRAWERS. J. A. Hebb, Smock, Pa., U. S. A. Improved method of drawing coke from ovens.

11,374 of 1899. LIGHTING MINERS' LAMPS. J. Warrington and E. Brown, Leeds. An improved electric lighter for miners' safety lamps.

PERSONAL.

Mr. G. M. Hyams, of the Bigelow syndicate, is visiting the copper mines of Upper Michigan.

Ex-Lieutenant Governor Edward F. Jones, of Binghamton, N. Y., has been in Joplin, Mo., looking after his extensive mining interests.

Mr. Ernest C. Wood, mining engineer, of Rossland, has again returned to Kamloops, B. C., to complete the sale of the Kimberly group to an English syndicate.

Mr. W. de L. Benedict, mining engineer, of New York City, has removed his office to 43 Cedar street. Mr. Benedict is now on a trip to Utah and California.

Mr. W. W. Tiner, of Iowa Hill, Cal., accompanied by Mr. J. O. Jones, of Sierra County, Cal., is on his way to Siberia via St. Petersburg to superintend mining properties.

Mr. A. W. K. Pierce, consulting electrical engineer for the Consolidated Gold Fields of South Africa, Limited, of Johannesburg, is in New York City investigating new machinery, etc.

Mr. H. E. Bucklen of Chicago has been in Joplin, Mo. He recently purchased all the developed mines and mineral land at Spurgeon, Mo., and is said to be looking after more property.

Mr. W. A. Ferguson has severed his connection with the construction department of the Westinghouse Electric and Manufacturing Company to accept a position as electrical engineer with the Montezuma Copper Company, Nacosari, Mexico.

Mr. A. S. Matheson, who has been general manager of the National Tube Company, has retired from that position, and will enter the councils of the combine. He will be succeeded by Wm. B. Schiller, who has been manager of the McKeesport plant. Mr. Schiller will be succeeded by Taylor Alderdice, who has been manager of the rolling mill, Monongahela furnaces, and the Boston Iron and Steel Works of the company in McKeesport. A successor to Mr. Alderdice has not been named as yet.

SOCIETIES AND TECHNICAL SCHOOLS.

Massachusetts Institute of Technology.—Members of the Civil Engineering Society went to Dorchester recently to see the model of the Boston Basin which Mr. C. C. Curtis had on exhibition and which has been sent to the Paris Exposition. Mr. R. B. Davis, assistant engineer of the Boston Elevated Railway Company, has recently spoken before this Society on "Elevated Railways." Lectures on "Electricity in Mining" are being given at the Institute by Mr. Timothy W. Sprague. While these lectures are included in the curriculum of the course in Mining Engineering, students in other departments have the privilege of attending.

International Mining Congress.—Arrangements for this gathering at Milwaukee, Wis., in June are progressing. Some of the papers to be read are: By Edward M. Shepard, Professor of Geology at Drury College, Springfield, Mo., on "Lead and Zinc Industry of Missouri;" by Kirby Thomas, of West Superior, Wis., on "Copper Mining in Northern Wisconsin;" by Mrs. Helen M. Gougar, of Lafayette, Ind., on "Women, Lead and Zinc Miners;" by N. C. Westerfield, of St. Paul, Minn., "A Brief History of the Progress of Mining in Western Ontario;" by William Bugbee, manager of the Hughes Gold Mine, Fort Union, Va., on "Modern Economic Stamp Milling and Hydraulic Classification and Concentration;" by L. D. Godshall, of Spokane, Wash., on "Treatment of Ores."

Society of Chemical Industry—New York Section.—The monthly meeting was held April 20th. The regular informal dinner at the Hotel St. Andrew preceded the session. Prof. C. F. Mabery presented 6 papers, in which he detailed his investigations on petroleum. His papers were entitled: "Constituents of Pennsylvania Petroleum Boiling Above 216 Degrees," "Composition of Natural and Commercial Paraffine," "Constituents of California Petroleum, with Some of Their Halogen Derivatives," "The Nitrogen Compounds in California Petroleum," "The Sulphur Compounds in Canadian Petroleum," "Composition of Japanese Petroleum." Prof. Mabery demonstrated the investigation of the various hydrocarbons contained in petroleum of different origin, described the nitrogen and sulphur compounds which were always present.

A lively discussion followed, in which Prof. Peckham, Dr. Bogert, Dr. Sullivan, Dr. Richardson and others took part.

Before the reading of Prof. Mabery's paper, Mr. Behrend exhibited an exceedingly interesting collection of acid-proof chemical stoneware in the most complicated forms. Finally, Mr. C. Baskerville's paper, "Analysis of Titaniferous Iron Ore," was read.

Engineering Association of the South.—The regular monthly meeting of the Association was held on the evening of April 12th, at Vanderbilt University, Nashville, Tenn. Mr. P. Byrne, of Birmingham, Ala., was elected a member. An invitation to the Association from Messrs. G. F. Blackie and H. D. Ruhm, of Mt. Pleasant, Tenn., to hold the annual outing of the Association at the plant of the American Phosphate Company was read. There was an unanimous expression in favor of the acceptance of this invitation, and a committee was appointed to make necessary arrangements.

The first paper of the evening, entitled "Sketching Topography with the Transverse Table," was read by Mr. R. L. Lund. This method was presented in an interesting manner, comparison being made with other methods, the conclusions reached by the writer being that this method was more accurate, rapid, more easily adapted to varying conditions, and cheaper. Dr. W. L. Dudley lectured on "Liquefaction of Gases." A brief history of the matter was given The varied fields of usefulness of liquefied gases were spoken of, and the possibilities for an increasing demand. Dr. Dudley performed a number of interesting experiments with liquefied carbon dioxide.

American Society of Mechanical Engineers.—The 41st meeting of the society will be held at the Grand Hotel, Cincinnati, O., May 15th to 18th. The opening session will be on the evening of Tuesday, May 15th, with an address of welcome by Mayor Tafel and a response by President Morgan, followed by an informal reception. At the session on Wednesday morning papers will be presented as follows: G. I. Rockwood, "On the Value of a Horse Power." H. T. Yaryan, "Hot Water Heating from a Central Station." W. S. Aldrich, "Systems of Efficiency of Electric Transmission in Factories and Mills." J. J. Guest, "Design of Speed Cones." In the afternoon there will be an excursion down the Ohio, with a visit to the plant of the United States Cast Iron Pipe and Foundry Company. At the evening session the following papers will be presented: R. H. Thurston, "Multiple Cylinder Engines." W. T. Magruder, "The Gas Engine Hot-Tube as an Ignition Timing Device." N. O. Goldsmith, "Water Softening Plant of the Lorain Steel Company." M. P. Higgins, "Education of Machinists, Foremen and Mechanical Engineers." At the closing session, on the morning of May 17, these papers will be read: A. Herschmann, "The Automobile Wagon for Heavy Duty." M. E. Cooley, "A Test of a Fifteen Million High Duty Pumping Engine at Grand Rapids, Mich." W. F. M. Goss, "Tests of the Snow Pumping Engine at the Riverside Station of the Indianapolis Water Company." B. C. Ball, "Cylinder Proportions for Compound and Triple Expansion Engines." In the afternoon there will be visits to points of interest and in the evening a reception at the Hotel Alms. On the 18th the plant of the National Cash Register Company at Dayton, O., will be inspected.

INDUSTRIAL NOTES.

The Montana Ore Purchasing Company removes its New York office on May 1st from 100 Broadway to the National Bank of Commerce Building, 31 Nassau Street.

Henry W. Peabody & Company of New York City recently received a contract for some $25,000 worth of mining machinery, for gold mines in the neighborhood of Vladivostok, Eastern Siberia.

The Salisbury Carbonate Iron Company has discontinued its New York office and will transact its business at Chapinville, Litchfield County, Conn., which is the location of its London Furnace.

Mr. E. E. Brown has been appointed electrical engineer of the Reading Railway, with headquarters at Reading, Pa. He was formerly of the coal mining department of the Delaware, Lackawanna & Western at Kingston, Pa.

The Edward P. Allis Company, of Milwaukee, Wis., has several large orders from the Compania Minera de Penola, of Mapimi, Mex., consisting of 3 large, direct coupled engines and generators, one hoisting engine, elevating and conveying plant and electric locomotive and appliances.

The J. H. Montgomery Machinery Company of Leadville, Colo., has sold one 8-in. vertical pump to go on the San Miguel River to force water 60 ft. for placer work; a 1-horse whim and equipment to S. P. Worrell, Cochiti, N. M.; ore cars and supplies to A. E. Baldwin, Palisade, Nev.; a car of ore cars to the Risdon Iron Works, San Francisco, Cal.

Geo. B. Eberenz, who a couple of years ago purchased J. Howard Wilson's old established assay office at Pueblo, Colo., has found it necessary to move to more commodious quarters, and he has just fitted up one of the finest and most complete chemical laboratories in the West. Mr. Eberenz previous to starting in business for himself had a large experience in his line at one of the smelters of Pueblo and in Mexico.

The Chicago Fire Brick Company has been incorporated at Chicago, with a capital stock of $10,000, to manufacture and deal in clay products. The incorporators are W. H. McCarthy, A. J. Giuse and Samuel Oppenheimer. The company succeeds to the business of the Chicago Fire Clay Product Company, and has taken over that company's yards at Chicago. W. H. McCarthy, formely connected with the Fire Clay Product Company, will be manager of the new company.

The General Electric Company, of Schenectady, N. Y., reports sales of 5 new car equipments, two 225-K. W. direct current generators and one 3-phase generator and appliances to the Northern Pacific's coal mines at Rock Springs, Wyo.; to the Helen Mine Company, Graham, N. M., a 50-H. P. hoist motor; to the Globe plant of the American Smelting and Refining Company, a 95-H. P. motor and a 25-H. P. locomotive; to the La Bella Mill, Water and Power Company, Victor, Colo., 5 electric hoists and various motors; to the Caroline M. Company, Ouray, a 100-H. P. motor.

The Lidgerwood Manufacturing Company of New York City has received a $12,000 contract for 3 auxiliary engines intended to serve as part of the equipment for the three 10,000-H.-P. electrical dredges now being built to the order of the Queensland Government, at Armstrong, Whitworth & Company's Walker Shipyards, Newcastle-on-Tyne. The dredges, which are valued at $1,250,000, are being constructed under the designs of Lindon W. Bates of Chicago. Among the other recent foreign orders that the Lidgerwood Company is at present executing is one for an electrical hoist for mining use in Japan.

The Berlin Iron Bridge Company, of East Berlin, Conn., has received a contract for 13 important bridges on the New York, New Haven & Hartford Railroad. Ten of these are large, heavy 4-track bridges, and 3 are to carry highways over tracks. Six of these are located at Bridgeport, Conn., and are plate girder bridges for carrying 4 tracks over the streets. There is also a very long 4-track riveted lattice bridge located near Boston on the Plymouth Division. All the work is to be completed by October 1st. The new boiler and power house for the Albany & Hudson Railway and Power Company will be located at Stuyvesant Falls, N. Y., and will be a fire-proof construction throughout. It will be furnished by the Berlin Iron Bridge Company.

TRADE CATALOGUES.

The Shelby Electric Company, of Shelby, is sending out detailed information relative to its damp-proof incandescent electric lamps for mine use.

The Palatlakaha Company, of Atlanta, Ga., in a 14-page pamphlet, calls attention to the merits of the kaolin produced by the company's mines in Lake County, Fla., and publishes the results of tests at various potteries.

A radial water tube marine boiler, patented by E. P. Watson, is described in a folder published by the Marine Iron Works of Chicago. It is recommended to steam users for its convenient form, accessibility, lightness and safety.

The Buffalo Forge Company, of Buffalo, N. Y., issues a little 12-page circular showing some of its latest patterns of quick-revolution engines, center crank horizontal, single action and tandem compound, side crank horizontal, center crank upright and marine type upright.

An 8-page pamphlet issued by Henry Maurer & Son, of New York City, describes the "Herculean" method of fire-proof construction. This method, employing a flat arch made of terra cotta, with light iron T rods, is stated to be simple, strong and entirely fire-proof.

The Westinghouse Electric and Manufacturing Company of Pittsburg, Pa., continues to issue its excellent series of illustrated pamphlets, describing various machines and devices it manufactures. Circular No. 1017, superseding catalogue No. 213, treats of alternating current potential regulators; No. 1018, superseding catalogue No. 235, describes alternating current switchboards, type 6, for polyphase circuits of 100 to 600 volts. No. 1019, superseding No. 232, illustrates alternating current switchboards, type 6, for polyphase circuits of 1100 to 2200 volts. Nos. 1020 and 1021 describe type 8 switchboards for the same circuit as Nos. 1018 and 1019. No. 1022, superseding catalogue No. 234 treats of Standard railway switchboards.

"Gold and Silver Mills" is the title of a 252-page illustrated catalogue published by Fraser & Chalmers, of London and Chicago. Beginning with the "Comet" rock crusher, the catalogue describes other crushers, then stamp mills and their parts, mortars, screens, shoes, dies and

cams. A prospector's 3-stamp mill of special design is shown, also steam stamps for coarse crushing. The catalogue gives plans and elevations of various forms of milling plants, including ordinary stamp mills or those of large size, with great ore bins, including the 120-stamp mill built for the Alaska-Mexican Company. For fine concentration, the catalogue shows Frue vanners. The silver and gold milling plants include wet crushing, with pan amalgamation, combination process, cyanide and chlorination. The catalogue contains much information, and is worthy of perusal by any one contemplating the erection of a gold or silver mill.

C. L. Berger & Sons, successors to Buff & Berger of Boston, Mass., publish a well-bound illustrated catalogue and handbook of 212 pages describing the engineers' and surveyors' instruments of precision manufactured by the firm. The book contains, besides descriptions, full directions for the use, care and adjustment of the various instruments, making it a very handy volume for the surveyor and engineer. Among recent patented improvements in its instruments to which the firm calls particular attention are the interchangeable auxiliary telescope for use on top or side in mining transits; the new solar attachment permitting the same auxiliary telescope to be used for determining meridians at any hour of the day; the short focus lens attachment for sights as short as 3 ft.; the instrument bracket permitting the transit or level to be set up in a cramped place in a mine, and the new spring tongue within the main tube of the telescope by which any wabbling in the focussing slide is removed.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods of any kind, and shall be pleased to furnish them information, catalogues, etc.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, and have no pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

ALABAMA.

(From Our Special Correspondent.)

Coal and Coke Production in 1899.—The official report of State Mine Inspector J. de B. Hooper has at last been issued. The total output is given for the year 1899 at 7,484,773 tons, with 124 mines and 12,881 employees. Jefferson County mined 4,700,982 tons; Walker County next with 1,117,372 tons; Bibb, 904,887 tons; Shelby, 359,213 tons; Tuscaloosa, 241,750 tons; and the balance mined in Blount, Cullman, Etowah, Jackson, Marion, St. Clair and Winston counties. The total coke output was 1,798,612 tons. There were 5,343 ovens in blast. Jefferson County produced 1,629,461 tons of the total output, with Bibb County next with an output of 75,774 tons. St. Clair, Tuscaloosa and Walker counties also produced coke.

ALASKA.

Charles G. Yale, the statistician of the United States Mint at San Francisco, states that the returns show that Alaska more than doubled its bullion product last year. The receipts of Alaska gold at mints, assay offices, refineries, smelters, etc., for the calendar year 1899 were $5,602,012, and silver $229,343, a total of $5,831,355, or $3,199,844 more than in the year 1898. Of this increase it is estimated that $2,400,000 came from the new placer camp at Cape Nome last season, the first year in its history, and the rest of the increase from the quartz mines of Southeastern Alaska. The placer camps along the Yukon River give evidence of only slightly increased yield for the year. In Southeastern Alaska, including Douglas and Unga islands, the quartz mines are now dropping 1,050 stamps and employing 1,308 men. The combined output of these quartz mines for 1899 was $2,704,176 out of a total of $5,831,355. This makes the yield of the placer mines of the district of Alaska $3,127,179, of which $2,400,000 came from beach and tundra claims at Cape Nome and the balance, or $727,179, from the placer camps along the Yukon River and its tributaries, placers near Golovin Bay, the beach sand mines at Lituya Bay, the hydraulic mines near Juneau and the claims in Porcupine District, Southeastern Alaska.

ARIZONA.

Graham County.

Arizona Copper Company.—The Bleichert tramway, at this company's Colorado mines, is about completed. It is over 1 mile long and has a capacity of 30 tons an hour. The towers are structural steel on rock or heavy masonry foundations. Power is to be furnished by a Weber gasoline engine. The Colorado group has not been worked for many years because of the diffi-

CALIFORNIA.

The Superintendent of the United States Mint at San Francisco has forwarded to the Director of the Mint at Washington the following table of approximate distribution by county of the gold and silver product of California for the calendar year 1899:

	Gold.	Silver.	Total.
Amador	$1,544,868	$ 6,902	$1,551,770
Butte	486,846	5,009	491,855
Calaveras	1,265,564	9,813	1,275,377
Del Norte	4,450	.....	4,450
El Dorado	404,497	8,414	412,911
Fresno	18,142	.....	18,142
Humboldt	69,059	.....	69,059
Inyo	114,187	57,529	171,716
Kern	863,414	6,810	870,224
Lassen	28,898	.....	28,898
Los Angeles	13,132	.....	13,132
Madera	73,758	292	74,050
Mariposa	562,829	2,207	565,036
Mono	697,069	47,547	744,616
Nevada	2,171,510	17,784	2,189,294
Placer	1,100,081	1,206	1,101,287
Plumas	381,151	15	381,166
Riverside	163,010	2,000	165,010
Sacramento	115,906	.....	115,906
San Bernardino	164,599	125,603	290,202
San Diego	333,650	.....	333,650
Shasta	873,719	196,213	1,069,932
Sierra	450,115	359	450,474
Siskiyou	991,771	100	991,871
Stanislaus	10,000	.....	10,000
Trinity	590,510	1,086	591,596
Tulare	13,610	.....	13,610
Tuolumne	1,635,769	15,111	1,650,880
Ventura	3,990	.....	3,990
Yuba	189,927	12	189,939
Totals	$15,336,031	$504,012	$15,840,043

The silver is given in commercial value, or amount obtained for it by producers when sold.

Comparing the totals of gold and silver with the corresponding figures obtained from the same sources in the year 1898, the gold yield of the State shows a decrease of $570,477, and the silver yield an increase of $89,957, making a net decrease from the previous year of $480,490. This is a very good showing in view of the dry season last year, when so many quartz mines had to hang up part or all of their stamps for a time, and when the water season for gravel mining was very short indeed.

Of the total of $15,840,043, the value of the combined gold and silver produced, the sum of $1,128,564 from hydraulic, $1,019,955 from drift, and $1,401,386 from placer mines. Included in the placer output is that derived from dredgers, river bed and bar, gulch, ravine and ordinary placer work by Chinese and whites. In the returns from quartz mines are included $353,743 gold and $210,219 silver, derived from copper mining and smelting operations in Calaveras, Shasta and San Bernardino counties. Also included in quartz returns are $5,021 gold and $64,620 silver from silver-lead mines in the counties of Inyo, Mono and San Bernardino.

Amador County.

(From Our Special Correspondent.)

Central Eureka.—The shaft is down 1,675 ft., and during this prospect work about $52,000 in gold has been produced. No stoping has been done. The ledges assay from $8 to $80 per ton. The mill is to be erected as soon as possible. The property is at Sutter Creek.

Mitchell.—The 80-ft. shaft at Volcano is being cleaned out and will be sunk deeper. The mill at the Dane Mine has been moved on this property and a new hoist has been put in. J. C. Hayner superintendent.

Oneida.—The machinery for this mine has arrived, and the 60-stamp mill will soon be completed. Robert Mein is at the mine.

Peerless.—The shaft at this mine, 2½ miles south from Jackson, is down 170 ft., showing black slate on the hanging wall, which is mixed with quartz, carrying a large percentage of sulphurets.

Butte County.

(From Our Special Correspondent.)

Amo.—A large amount of money has been expended on this hydraulic mine, near Forbestown road, about 2 miles from Oroville, in building a restraining dam and a large flume about 1 mile long. Active work is to begin soon under the superintendency of T. W. Reece.

El Dorado County.

(From Our Special Correspondent.)

Rich gold quartz has been found at a depth of 50 ft. on the Thomas Orr place, 7 miles northeast from Folsom. The ledge is 3 ft. in width. A prospect tunnel is to be run from the New York Ravine.

Kern County.

(From Our Special Correspondent.)

Slate Range Mining Company.—This company is milling $12 rock in a Lane slow speed roller mill lately erected. G. L. Bradford is superintendent.

Mono County.

(From Our Special Correspondent.)

Teams are now hauling tailings to the Standard Cyanide Plant No. 1. The No. 2 plant is kept in operation all the year round, the tailings running directly from the mill to the plant.

Nevada County.

Champion Mining Company.—At the recent annual meeting at Nevada City the following directors and officers were elected for the ensuing year: President, G. Kartschoke; vice-presidents, Joseph Fetz and J. S. Schuster; secretary, J. F. Holling; superintendent, F. Zeitler; directors, I. L. Rosenthal, J. Assion, H. Steinegger and J. S. Ott.

(From Our Special Correspondent.)

Conlon.—This mine, on Osborne Hill, is to start up soon. The Daisy Hill pumping plant is working satisfactorily. A new mill is to be put in.

Union Hill.—On the 255-ft. level a new ledge has been struck at the end of the 450-ft. drift. The vein is 3½ ft. wide, showing free gold. As soon as the shaft has been freed from water a mill will probably be erected. Before the mine closed down ore valued at from $15 to $80 was milled.

Placer County.

(From Our Special Correspondent.)

Eureka Consolidated.—The lower tunnel of this drift mine, 2 miles north from Sunny South, is in 3,276 ft. in a blue lead. The upper lead, 200 ft. higher, is of grayish color.

Plumas County.

(From Our Special Correspondent.)

Halsted.—This mine on the east branch of North Fork of Feather River near the mouth of Rush Creek, and the claims of W. E. Duncan in the same locality, are to be worked under bond. They are considered promising gold quartz properties.

San Bernardino County.

(From Our Special Correspondent.)

Bagdad.—This mine in the Buckeye District is being worked under bond by W. R. Woodward. It is said that the superintendent, C. Grant, has uncovered a large vein of high grade ore.

J. R. Gentry.—This claim, owned by Sutter, Meade and associates, is being developed by a 2-compartment incline shaft, now 45 ft. deep, and 2 levels 18 and 25 ft. long. So far the ore shipped is said to have yielded about $10,000. W. Allen, the superintendent, works 9 men. The property is in the Buckeye District, 8 miles south from Ludlow.

Siskiyou County.

(From Our Special Correspondent.)

Arrangements are being made to prospect Adams Creek with the Souther steam drilling plant now at Oak Bar. Holes will be sunk to bedrock along the creek bed from Fort Jones to Deadwood. This creek is known to be rich, but could not be worked on account of the great amount of water at bedrock, which is just what is needed for a dredger plant. J. C. Burgess is superintendent.

Twelve miles from Gazelle several fine prospects have been located. A large number of men are prospecting on the East Fork side of the mountain and on the Shasta Valley side. Several claims have been bonded.

Dewey.—Eighty men are at work on the new wagon road from this mine to Gazelle.

Schroeder.—At this group of mines, 7 miles west from Yreka, the new owners are prospecting with a large force of men. An extensive plant will be erected as soon as the development work will warrant.

Sierra County.

(From Our Special Correspondent.)

Buttes Saddle.—This property, 2 miles from Sierra City, comprising 2 claims, has been bonded to P. M. Keeffe, who will put men at work in the lower tunnel, which is in over 1,200 ft., on a vein from 4 to 5 ft. wide, carrying high grade sulphurets. The mine is well equipped with a tramway, mill, water wheel, etc.

Dakota Mining Company.—This company has been incorporated to develop the Magnolia Mine, located between Goodyear, Bar and Forest. The directors are Mrs. Jennie Ross, James Ross, J. W. Phelps, Annie Lord and Wilford Abbott.

Trinity County.

(From Our Special Correspondent.)

Enterprise.—The tunnel is being driven and ore is milled. Another tunnel is being run to tap the pay shoot of the Lone Jock at considerable depth. Water power is obtained from the river through a ¼-mile ditch. The property is located on the East Fork of Trinity River, 1 mile south from Coleridge.

Lapin.—This mine at Deadwood, owned by Brady, Tourtelette, is producing some good ore from the lower tunnel, which is milled in an arrastra. The property has been worked 3 years.

Last Chance Gold Mining Company.—The survey of the extension of the ditch from Grass Valley Creek, near the Lowden Ranch, is nearing completion. Contracts will be let and the ditch completed as soon as possible. A large hydraulic plant is to be equipped and a large force of men employed during the season. The company controls about 1,500 acres of placer land in the Douglass City & Lowden Ranch Mining districts, besides valuable water rights.

Yellow Rose, of Texas.—The new Huntington mill and boiler for the plant now in course of construction at this mine, at the head of Union Creek, is on the way in and will be in operation by June 1st. A contract has been let to run a lower tunnel.

Tuolumne County.

(From Our Special Correspondent.)

Free Lance.—There are 3 tunnels on this property, 84, 109 and 527 ft. respectively. The vein at the face of the latter is 7 ft. wide, carrying 5 ft. of good milling ore, said to assay $6.25 free gold and $18 in sulphurets. A ditch to supply water for the mill is almost completed. The fall to the mill will be 325 ft.

Hope.—The high grade ore at this mine, near Sonora, still holds out, and is milled at the Mason Mill. The north extension, which has been idle for some time, will start up in a few days.

Victoria.—Some rich rock is being taken from this mine, northeast from Soulsbyville, on the eastern side of the river. The shaft is down 50 ft. on an 8-ft. ledge. A mill and concentrator are to be put in.

COLORADO.

Boulder County.

American.—This old-time mine, at Sunshine, was sold recently to T. R. Mann, of Boulder, for $35,000. The mine was a heavy producer of rich ore from the upper workings. When the bodies of oxidized ore were exhausted and the sulphides were reached at water level, the mine was closed for a short time, but subsequently operations were resumed, and for the last 3 or 4 years has been worked quite regularly, most of the work being on development, though considerable of the high grade ore has been shipped. The ore carries both gold and silver, and the mine has opened a large body of low grade milling ore, which runs from $12 to $15 a ton. It is now to be developed with the view of treating the ore at the Culbertson mill at Boulder. Mr. Mann, who came to Colorado from Philadelphia, is one of the largest stockholders in the Colorado & Northwestern Railroad, and also in the Culbertson mill.

Chaffee County.

Annie C.—The mill on this group, a few miles north of Buena Vista, is now running at full capacity, the mine and mill employing about 30 men. A Cripple Creek Company, headed by Bartlett Wiley, recently secured control of the property and is working it in an energetic, intelligent manner. A $15,000 plant of machinery is now in place.

Friday.—The Eastern lessees of this mine, in the Klux district, are on from Philadelphia attracted by the reported discovery of a 5-ft. continuous body of $50 ore, and are making arrangements for new machinery and a larger force of men.

Clear Creek County.

(From Our Special Correspondent.)

John Owen Mining and Milling Company.—Boston men who are working the Amy C., Washington and Freighters' Friend Mines under this name at Idaho Springs have unwatered the shaft and are ready to work. A new compressor is being installed for sinking.

Seaton Mining Company.—This company at Idaho Springs has recently acquired a number of other claims adjoining the Seaton. Drifting is going on in the Foxhall Tunnel, which cuts the vein at about 700 ft., and when connection is made all ore will be moved through the tunnel, big plants being erected at its mouth. The company is also drifting on the vein in the Newhouse Tunnel at a depth of 1,900 ft. The first shipment from the tunnel came from this vein on April 12th. It is the intention to raise on the Seaton and at the same time sink the shaft to connect with the deeper workings. Since the present manager J. J. May took charge, the mine has produced enough ore from development to pay for all the dead work, acquire claims and add new buildings and machinery.

Senator.—A company recently organized to work this mine at Dumont is erecting a big concentrating mill and running a tram from the mine to mill. Water power from Clear Creek is to be used. About 50 men are employed.

Gilpin County.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—Thos. W. Hough to the Good Luck Mining Company, the Prize Baby lode; P. Erickson, to J. E. Schorr, ¼ interest in Spring group of 7 claims; W. O. McFarlane et al., to R. Mackey, the Mammoth placer claim; H. Tarbell to the Demer-Joplin Mining and Milling Company, 1-8 interest in Dunkin lode; L. Bohling to S. Dougherty, ¼ interest in Decoration lode; F. S. Howard to L. B. Horn, the Howard lode; S. Dougherty to R. L. Parrish, ½ interest in Champion, Sampson, Dewey and Columbia lodes; ¼ interest in Snow Flake and Decoration lodes.

Americus.—A shipment of iron made this week gave values of $145 per ton, coming from the 400 east level. L. S. Newell, Jr., is manager.

Bates-Baxter.—In extending the east 250-ft. level, a nice vein of smelting ore has been opened, carrying above average values. Indications are ripe for increased shipments. H. J. Sears, Central City, is manager.

Gilpin & Boston Gold Mining Company.—Sinking is going on in the Gladstone shaft; this lift of 100 ft. will make it 300 ft. deep. Shipments are being made, mill ore running from 3½ to 4½ ozs. gold per cord, tailings being of a high value. Screenings brought $32 per ton. The property promises well, and a gasoline plant and new shaft house are to be put up on the Firenzi claim. J. W. Holman, Central City, is manager.

Kansas-Burroughs Consolidated Mining Company.—Sinking has started in the Phœnix-Burroughs shaft, at a depth of 1,100 ft., on another lift of 100 ft. Pat McCann, Central City, is manager.

Perigo Mill.—The main shafting at this mill, operated by the Tonawanda Leasing and Mining Company, broke and could not be brought in to be repaired for over a week. The mill has started again. E. M. Messiter, Perigo, is manager.

Queen of the West.—A good body of ore has been opened up in 700 west level, showing a nice 12-in. streak of smelting ore, besides a good body of milling ore. H. J. Stephens, of Denver, the owner, is figuring on putting up a 10-stamp mill equipped with rapid drop stamps. L. L. Moe, Central City, is manager.

Ridgewood.—Boston men interested are taking out the water preparatory to sinking. C. K. Colvin, Central City, is manager.

Lake County—Leadville.

(From Our Special Correspondent.)

Ore Tonnage.—Owing to bad roads, the production has been running about 2,000 tons a day. Conditions are better again, and 2,500 tons daily are now moved.

Banker Mining Company.—Manager Guth has the shaft on the Banker below the 1,000-ft. level. The bottom shows considerable mineralization.

Big Four.—This property, belonging to Illinois people, is now under lease to J. F. Walsh and Martin Condon, each lessee having a portion of the ground. The principal work is between the 300 and 400 ft. levels, and about $4,000 was taken out this month.

Boston Gold-Copper Smelting Company.—Plans for additional furnaces and other improvements to give the plant a capacity of 1,000 tons per day, are being drawn up.

Coronado Mining Company.—Fire, caused by a lamp explosion, destroyed part of the shaft house and did other damage. The repairs are about completed, and shipments will be resumed. Two drifts, being run toward the Midas line, have broken into good iron ore bodies.

Deer Lodge.—The Deer Lodge and Aimee leases worked by John Goodman & Company, on Fryer Hill, are producing 15 tons daily of very desirable iron ore.

Fortune.—A heavy daily tonnage is coming from the big Evans property. A lead ore body is being opened.

Greenback.—Shipments average 150 tons daily of a fair grade sulphide ore, which comes from 1 level at 1,100 ft. Sinking to develop better the lower contacts is considered.

Home Mining Company.—The announcement of a $1 dividend has caused much rejoicing. The company is now shipping 400 tons of ore per day and opening up larger ore bodies than ever. It has paid out in the past 18 months since work of pumping was commenced about $500,000 in wages and other expenses. The company owns all of its machinery, amounting to over $75,000.

President.—A new plant is being put in to increase shipments, which now are 35 tons daily. Development work is at the southern end of the claim. In one upraise ore shows 40 ft. thick. The property is a gold proposition on Breece Hill, near the Ballard, and is operated under lease by Messrs. Carnahan & Connors.

Resurrection Gold Mining Company.—Shipments are 250 tons daily. No. 2 shaft is down nearly 500 ft. The contract calls for a total depth of 900 ft.

St. Louis Tunnel.—The lessees are shipping steadily a good grade carbonate ore. Mr. Zobel, the owner, is also running a tunnel shaft at 200 ft., and drifting toward the Fanny Rawlings, opening a nice body of copper sulphides.

Toledo Avenue Mining Company.—The company, which is to work the ground adjoining the Home Company territory, has secured over 80 acres, and is to sink a new shaft on the Humboldt or Arnold placers. The company is stocked for $150,000. Eastern people are interested.

Valentine.—Everything is ready for the new plant of machinery, which will be put in as soon as the roads permit. This is the old Lucky Webber property on Brooklyn Heights. Eastern men are back of the proposition.

Zinc Shipments.—The tonnage is 200 tons per day of concentrates and crude ore. Nearly all of this goes to foreign ports, and will be considerably increased during May.

Ouray County.

Trout.—On this claim, in the city limits of Ouray, rich ore has been struck. A car lot is being sacked for treatment at the Haggerty Smelter.

Home Mining Company.—This company has miners working on its claim adjoining the Camp Bird, where high grade ore is being taken out.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

Mining Conditions.—The long storm is ended, the roads, though, in many cases are impassable, but the outlook is better. Several mines have been obliged to close from a lack of coal. One or two of the local mills have agreed to pay the old price of $20 per oz. for gold, and it is understood the valley mills will do likewise, as also the Guggenheims' Pueblo Smelter. The local mills and the Metallic Extraction Works have closed from lack of ore.

Elkton Consolidated Mining Company.—The properties of the 3 companies are situated on Raven Hill and adjoin. The capital stock will be 3,000,000 shares of the par value of $1 per share. The Elkton stockholders will get 1,375,000 shares, the Raven 625,000, and the Tornado 500,000 shares, making a total of 2,500,000 shares. The remaining 500,000 shares of the 3,000,000 will be kept as treasury stock. The Raven turns over all its treasury reserve amounting to about $50,000 in cash and about 24.5 acres of ground and all the improvements upon it. The Tornado turns over about $50,000 in cash and about 14 acres of ground. The old Elkton contributes its treasury fund and 34.5 acres and all improvements, giving the new company about 70 acres of ground. While the deal to be absolute has to be ratified by the stockholders of the companies, it is understood that the deal is sure to go through. Geo. Bernard of the Elkton will be president and general manager.

Good Will Tunnel and Mining Company.—Work on the tunnel will soon start, arrangements being completed. It is understood that a contract has been let for 500 ft., as well as for widening that part of the tunnel that was run by hand before it closed down.

Work Mining and Milling Company.—At the annual meeting of the stockholders in Colorado Springs, the following directors were elected: J. A. Connel, I. W. Bonbright, W. P. Wight, G. R. Buckman and D. D. Lord. The officers report that for the first time in its history the company is out of debt. The property is all worked under lease, the most important being that operated by the Morning Glory Mining and Leasing Company, one of the companies controlled by the Woods Investment Company. This lease has at present 29 months to run. The shaft is down 625 ft. and it is the intention to sink deeper. During the past 10 months the ore shipped by the lessees netted the company $99,211, which, paying expenses and the royalties to the lessees, left the company $9,782. There is now a balance in the treasury of $5,531. At a meeting of the newly elected directors the following officers were chosen: President, I. W. Bonbright; vice-president and general manager, J. A. Connel; treasurer, W. P. Wight, and secretary, D. D. Lord.

GEORGIA.

Lumpkin County.

Standard Gold Mining Company.—The company met April 18th at the company's office in Dahlonega and elected the following officers, to-wit: J. W. Adams, president; Geo. H. Breymann, vice-president; R. C. Thomson, secretary and treasurer; H. D. Ingersoll, general manager. Board of directors: J. W. Adams of Chattanooga, Tenn.; Geo. H. Breymann of Toledo, O.; Frank G. Thomson, Toledo, O.; H. D. Ingersoll, Dahlonega, Ga., resident manager of mines; F. R. Adams, Delaware, O.; R. C. Thomson, Dahlonega, Ga.; J. G. Rosenthall, Delaware, O.; Mark Hopkins, St. Clair, Mich.; Wm. M. Fisher, Columbus, O. The officers and directors of this company are also connected with the Consolidated Company, being officers and directors of both.

IDAHO.

Idaho County.

Cougar District.—Good finds of gold-bearing ore are reported in Cougar Mountain, on the Middle Fork of Clearwater River. Assays made at Grangeville show values of $12 per ton.

Owyhee County.

Tip Top.—This group of claims, on Florida Mountain, near Silver City, owned by W. S. Cornick, of Salt Lake, is reported bonded to the

Trade Dollar Consolidated Mining Company. The Lincoln 20-stamp is included in the deal. A shaft has been sunk 300 ft., showing a wide body of low grade ore.

Shoshone County.

Amador Mining Company.—The ditch line is completed and a saw mill is to be erected. In the upper workings of the mine a station has been cut at the end of the crosscut tunnel, where sinking on the lead will begin at once.

Amazon.—The M. Prager Company, Limited, has sold its ⅓ interest in the Amazon and ¼ interest in the Manhattan to B. N. Hillard. The records show the purchase price to be $30,000.

Echo Mining Company.—This company has been incorporated to work 12 claims in the neighborhood of the town of Burke. The officers are: Carl Amonson, president; F. P. Green, secretary; Wm. H. Smith, treasurer; Ed Heden, vice-president, and H. F. Samuels.

Klondyke.—Over 500 ft. of development work was done on this claim at Pierce last winter.

Mascot.—This mine, at Pierce, is putting in another Hendy battery, increasing its capacity to 20 tons daily.

Reed's Creek Hydraulic Company.—This company employs about 20 men in its placer ground at Pierce, and is about to begin work for the season.

MICHIGAN.

Copper—Houghton County.

(From Our Special Correspondent.)

Arcadian.—At No. 1 shaft the permanent shaft and rock house is in commission.

Elm River Mining Company.—At the annual meeting in Jersey City, on April 18th, the treasurer's statements showed receipts from capital stock and interest of $1,204,307. The expenditure for real estate was $600,000; for labor and material, $66,342; for machinery and equipment, $34,604; for construction, $47,094. Superintendent Chynoweth reported exploration work as follows: Winona lode, 2,009 ft.; Shawmut lode, 373 ft.; Diamond drill works, 1,797 ft.; total, 4,179 ft. The Winona lode has been exposed for 4,800 ft. by trenches, test pits and shafts; 333 ft. of workable shafts have been sunk and 412 ft. of levels have been drifted.

Isle Royale.—Excavation for the new stamp mill on the shores of Portage Lake has begun. Most of the machinery has been ordered.

Trimountain.—This company will erect a new shaft and rock house at No. 1 shaft.

Copper—Keweenaw County.

(From Our Special Correspondent.)

Arnold.—This mine is producing 65 tons of mineral per month.

Copper—Ontonagon County.

(From Our Special Correspondent.)

Adventure Consolidated.—This company is erecting a building for a new 20-drill compressor, which arrived lately.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

New Mining Companies.—Crumbs-Creston-Joplin Mining Company, Creston, Ia.; P. J. Claybaugh, president; capital, $18,000. New Century Zinc Company, Kittery, Me.; W. H. Spooner, president, Boston, Mass.; capital, $100,000. Jack Howard Zinc Mining Company, Kittery, Me.; F. H. Morgan, Cambridge, Mass., president; capital, $100,000. Vesuvius Lead and Zinc Mining Company, Lafayette, Ind.; D. H. Flynn, president; capital, $40,000. Hub Mining Company, Elkhart, Ind.; A. H. Beardsley, president; capital, $50,000. Maple Leaf Mining Company, Des Moines, Ia.; F. A. Cope, president; capital, $50,000. Nutmeg Mines Company, Portland, Me.; B. H. Hibbard, president, New Britain Conn.; capital, $200,000. Waban Mining and Milling Company, Kittery, Me.; G. Agry, Jr., president, Newton, Mass.; capital, $100,000. Black Cat Lead and Zinc Mining Company; F. G. Benham, president, Saginaw, Mich.; capital, $100,000. Michigan Lead and Zinc Company; F. G. Benham, president, Saginaw, Mich.; capital, $50,000. Histo Zinc and Lead Mining Company, Jefferson City, Mo.; capital, $100,000; E. P. Sellmeyer, president, Jefferson City, Mo. Old Glory Mining Company, Joplin; capital stock, $20,000; offices and headquarters, Joplin, Mo.; incorporators, A. B. & J. F. Hollis, Kansas City, Mo.; D. G. Doane, Joplin. West Alba Mining Company, capital $100,000; incorporators, W. G. Bryant and A. F. Carmean of Carterville, F. Bremmerman and J. P. Stewart of Webb City and J. C. Stewart, who holds the majority of the stock. The Newark-Brooklyn Lead and Zinc Mining Company of Joplin, capital $100,000; incorporators, E. J. Hickok and H. L. Cadmus, Newark, N. J.; Amzi T. Dodd and H. A. Earlborough Joplin, and T. C. Hickok, Bringley, N. Y. The Mohawk Valley Mining Company, capital $70,000; incorporators, S. D. & C. F. Cary, Webb City, and others. The Beacon Hill Mining Company, Joplin, capital $150,000; incorporators, F. P. Rogers of Boston, Mass.; D. E. Blair, C. C. Cummings and C. W. Adams of Joplin. The Rand Mining & Milling Company of Topeka, Kan., capital $5,000,000; incorporated in West Virginia by T. H. Bain, W. L. Hurst and T. J. Fish, all of Topeka. The Reel-Huston Mining and Smelting Company, of Wentworth, Mo., capital $50,000; incorporators, E. L. Reel, W. A. Reed and D. D. Huston, with offices in Joplin. The Delmar Mining Company of St. Louis, capital $50,000; incorporators, H. M. Eaton, St. Louis; A. F. Nathan and F. B. Wilcox, Kansas City. The Elm Grove Zinc and Lead Mining Company of Joplin, capital $100,000; incorporators, Herbert L. Wall, Wm. M. Cunningham and others of Cleveland, O.

Joplin Ore Market.—The favorable weather resulted in a large output, and as the demand for ore was brisk the sales show a very large increase. The best price paid was for 2 cars from the Sphynx Mining Company at Neck City, which sold for $33.50 per ton, on assay. Outside of this one lot $32.50 was the top and considerable fancy ore sold at this price. Lower and medium grades advanced from 50c. to $1 per ton. Lead sold all the week at $27 per 1,000 lbs. Fifteen cars of spelter from the Lanyon Zinc Company's works at Iola, Kan., passed through Joplin April 20th en route to Port Arthur, Tex., for shipment abroad, and it is said that several other smelteries have heavy export orders.

During the corresponding week last year, zinc ore reached the highest price ever known, some fancy ore selling at $55 per ton and lead sold for $25.50 per 1,000 lbs. The sales were less than this week by 945,870 lbs. of jack and 612,550 lbs. of lead, but the value was greater by $63,587. For the first 16 weeks of last year the lead sales were less than this year by 3,413,780 lbs., but the zinc sales were greater by 8,749,630 lbs. and the value was greater by $519,934.

As compared with previous week, the sales show an increase of 817,650 lbs. of zinc and 467,630 lbs. of lead, and the value was greater by $26,806. Following is the turn-in by camps for the week ending Saturday, April 21st:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,284,450	635,510	$51,997
Galena-Empire	2,127,700	328,290	39,158
Carterville	1,946,020	226,230	35,398
Webb City	871,980	51,720	14,475
Belleville	385,380	6,280	6,240
South Jackson	216,650	25,520	3,714
Central City	56,310	17,230	1,253
Stotts City	230,380	.....	3,465
Duenweg	465,540	89,380	8,801
Neck City	291,450	1,230	4,842
Aurora	1,035,000	24,900	12,405
Oronogo	643,950	1,210	9,374
Cave Springs	146,450	8,590	2,282
Carl Junction	128,320	.....	1,866
Carthage	91,150	.....	1,412
Granby	294,000	14,000	4,300
Everton	54,690	.....	547
District total	11,271,820	1,429,890	$201,549
Total 16 weeks	152,209,220	17,856,970	$2,818,726

Mining Sales.—The Rubber Neck Mine, mill and lease at Neck City, together with the fee of 160 acres, was purchased last week by the English syndicate which recently purchased the South Side Mines at Galena. The deal was closed by Henry Seely of London and the price was reported as $300,000. Henry Weymann, president of the Collinsville Zinc Company, has sold 80 acres at Duenweg and 40 acres east of Joplin to J. W. McCulloch of Owensboro, Ky., for $60,000. Several producing mines are located on the properties. Charles L. Thomas & Company of Joplin have purchased the Frankie Norton mine and mill at Galena for $15,000 from the Chicago-Joplin Zinc Company. Kansas City parties have purchased a ½ interest in the Jack Pot Mine at Duenweg for $5,000. Noble & Rich have sold their mine on the ground of the Missouri Zinc Fields Company at Carterville for $10,000 to Eastern men. J. W. Ground has sold his lease of 34 acres of the McKibben & Laing land, north of Joplin, to Thomas C. Clary of Joplin and Dr. A. J. Cook, C. W. Fuller and O. M. Stafford of Cleveland, O., who have also purchased the ¾ interest in the sub-lease on the same ground operated under the name of Clark & Company. The price paid for the two properties was $40,000.

J. P. McCann and W. D. Wilfley of Galena claim to have discovered a process of separating mundic iron pyrite from zinc ore so that it will be no great detriment to miners hereafter, and will erect a mill on the McCann land to treat ore containing mundic.

MINNESOTA.

(From Our Special Correspondent.)

Navigation is opening about a week earlier than last year, when May 3d a large fleet was icebound at Duluth. Every dock is receiving ore, and will be full in a few days. The new dock of the Eastern Minnesota will be completed next week. This is the largest timber structure in the world, including its mile-long approach, and has been a very costly erection. The No. 3 dock of the Duluth, Missabe & Northern will not be finished for a month.

About 300 men are working on the Duluth, Missabe & Northern's cut-off round Crooked Lake to shorten the line for Biwabik ore shipments. The line parallels the Duluth & Iron Range.

Iron—Mesabi Range.

(From Our Special Correspondent.)

American Mining Company.—This company received 2 very large locomotives this week. Five shovels will be employed at the Sauntry Mine. The Machinery plant at the Clark Mine has started.

Explorations.—In section 3, T. 57, R. 21, ore has been found. In the west side of 14, T. 58, R. 19, ore has been found by drills. In the Humphreys explorations, in the townsite of Virginia, 2 drills are working. It is stated that $150,000 has been refused for the 40-acre tract. By a shaft and drifts at the Sparta it seems to be probable there is ore under the town of Sparta. The explorations of the Minnesota Iron Company in section 4, near Virginia, have been abandoned. Pickands, Mather & Company will start explorations s w from the village of Eveleth as soon as possible. The Biwabik Mining Company will explore near the Elba, when drills can be had. J. M. Thomas will put drills on 32, T. 57, R. 19. There would be much more exploration to-day were it possible to get the machines and men. Though fully a hundred diamond drill men have arrived from South Africa in a month, none are to be had.

Fayal Iron Company.—This company starts shipping with 300,000 tons in stock, and will mine from underground about 600,000 tons during the year. In addition, there will be 2 90-ton Barnhart shovels in the open pits, which can easily mine 1,000,000 tons before winter. In all, 550 men are at work for the company and 450 more stripping for the contractors. There are carpenters building 45 dwellings, a $15,000 school house and a large amount of other building. A brick machine shop, the finest in northern Minnesota, is under way.

Mahoning Ore Company.—This company has begun shipments, with 2 Bucyrus 90-ton shovels at work. There has not been water enough in this mine for the engines, and during the winter Carson Lake, a mile west, was tapped. An additional large stripping contract has been given Winston & Dear, who will be employed all summer. Three heavy shovels and three 60-ton locomotives will be required for mining operations there.

McGregor Iron Company.—This company is sinking a 3-compartment shaft on its property, the n e of the s w, and th n w of the s e, section 6, T. 57, R. 20. Ore at that point is 140 ft. below surface, and is very deep. Two boilers are being set, and two Webster, Camp & Lane 5-ft. drums. Ore will be shipped this year. S. J. McGregor is superintendent; S. Dessau, New York, president, and R. P. James, mining captain. The headquarters are at Hibbing, Minn. Besides this 80-acre tract the company has 240 acres surrounding it, on much of which ore has been cut. The ore has all the characteristics of the Hibbing group. Messrs. McGregor & Dessau have secured an option for a mining lease from J. P. Christianson, on the w ½ of the n w ¼ of section 12, T. 58, R. 18, near Virginia, and will explore at once.

Minnesota Iron Company.—This company has taken what appears to be a very large body of ore in 21 and 22, T. 59, R. 14, 10 miles northeast of the Biwabik group, which has been considered the most easterly of profitable mineral fields of the Mesabi range. This land belongs to the Taylors Falls & Lake Superior Railroad (St. Paul & Duluth), and was leased by Hawkins, Vivian, Wallace & Moon, at 25c., who put down 3 drill holes unsuccessfully. The fourth and fifth holes showed excellent ore, running as high as 63% iron to .030% phosphorus. They sold to the Minnesota Company for $60,000, with the agreement to continue explorations and be paid $400,000 when 12,000,000 tons are shown up. Several drills and boilers are being taken in, and the prospects are for a large mine. The land is within a mile of the Duluth & Iron Range tracks, and on the direct route of travel for 15 years.

Oliver Mining Company.—This mine will begin shipping on a large scale next week.

Spruce Mining Company.—This company is in ore with 3 shafts, though work on the location was not begun till about 3 months ago. No. 1 is down 190 ft., and drifting is in progress. No. 2 is well in ore, and a pump station 35 ft. long by 16 ft. high has been excavated and a compound condensing 700-gal. pump is being installed. No. 3 is a timber shaft. The machinery will be running in 3 weeks, and the mine should make 100,000 tons this year with ease.

MONTANA.

Beaverhead County.

Birch Creek Copper Mining and Smelting Company.—Butte men have organized this company to work the Indian Queen copper claim, on Birch Creek, 12 miles from Dillon. It is composed of R. H. Dawe, president; Joseph Annear, vice-president; Ben Annear, treasurer and secretary, and Tom Ellis. The claim has been worked in a desultory fashion for several years. It has a shaft 200 ft. deep, and a drift 175 ft. long, in ore. The ore is a carbonate character, with small stringers of sulphide. A tunnel is

being driven to crosscut the lead, and is in 45 ft. It is estimated that the vein will be reached at a distance of 600 ft., which will give a depth of 450 ft. from the surface. No water has yet been encountered. The vein is from 5 to 7 ft. wide.

Flathead County.

Silver Butte.—The Spokane parties who are operating this mine, near Vermillion, have 2 shifts at work, there being 12 men employed altogether at the mine. The ore has been cut in the lower tunnel, and the ledge. The ore was encountered about 800 ft. in, and gives a vertical depth of about 500 ft. Owing to the condition of the roads, no ore is shipped. It is understood the concentrator will start up in a short time.

Lewis & Clark County.

Montana Mining Company.—The cabled report for March states that the total output of ore that month was 4,640 tons yielding 1,370 oz. gold and 7,830 oz. silver. The net estimated return is $31,200, while the expenses were $32,900, making a loss of $900.

Madison County.

Gravelly Range.—This ridge of gravel, near Virginia City, is to be thoroughly tested by a drill made especially for this particular ground by the Keystone Drill Company, of Beaver Falls, Pa. Later in the season a survey will be made for ditch from the Hell Roaring fork of the Madison and for the location of reservoirs to hold the spring floods. B. J. Fine will be in charge of the work and the enterprise is said to be backed by capital furnished by New York and English people largely.

Silver Bow County.

Colusa-Parrot.—This company of W. A. Clark's has brought another suit in the Federal Court against Anaconda for $600,000 for alleged damages for ore taken from the Colusa-Parrot vein. The suit is based on facts brought out in another suit between the same parties now on trial in which the ownership of the vein is involved.

NEVADA.

Eureka County.

Ruby Hill Tunnel and Mining Company.—This company, of Eureka, Nev., has elected the following directors for the ensuing year: P. H. Hjul, M. Bartlett, James Wilson, A. Laird, P. Paroni. The trustees elected the following officers: P. H. Hjul, president; M. B. Bartlett, vice-president; B. F. McEwen, secretary and treasurer.

NEW JERSEY.

Sussex County.

New Jersey Slate Company.—Messrs. Hopkins & Williams have secured articles of incorporation for the slate quarries at Newton, capitalized at $50,000. It has already ordered a large quantity of new machinery.

NEW MEXICO.

Otero County.

De Meules.—Christian Mueller, formerly of Amizett, has secured a lease on this turquoise mine, near Jarilla, in the Jarilla Mountains, from the New York owners. Part of the output will be handled by Santa Fe dealers.

Taos County.

Frazer.—Dr. William Brandreth of New York is to erect a 40-stamp mill on this group of 11 claims at Amizett. The ores run in copper, silver and gold.

PENNSYLVANIA.

Anthracite Coal.

Black Ridge.—This colliery near Hazelton is to be reopened. The old workings will be drained by tunnel.

Delaware, Lackawanna & Western.—The company is constructing a large coal storage plant on the Dodge system at Scranton. The plant will have a capacity of 110,000 tons.

Newton Coal Company.—Four judgments, aggregating $363,698, have been entered against the company, which operates collieries at Pittston.

Bituminous Coal.

Penn Gas Coal Company.—This company is opening shaft No. 3, south of Irwin, which has been idle a number of years. The company is also making preliminary arrangements to sink a new shaft near Millville. Both mines will be fitted out with the latest improvements and the motive power used will be compressed air.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Black Hills Porcelain Clay and Marble Company.—This company has purchased a mica mine of Dr. H. H. Reinbold, E. N. Davis and Peter See, of Custer, about 10 miles from that place. The company has 20 men at work at the marble and kaolin ledges. The company has asked for bids for a complete marble quarrying outfit, including a channeling machine, the total cost being about $10,000. B. R. Noble, of Yale, Mich., is president of the company.

Carr.—Another rich strike of ore is reported at the Carr Mine, on Lightning Creek, 10 miles west of Custer. One of the owners has found a 14-in. vertical, which pans rich.

Chicago Mica Company.—W. C. Edgar, president, and H. S. Recob, secretary and treasurer, have been in Custer from Chicago. The company has placed an order for a Raymond impact roller mill of 10 tons capacity, which is to be set up in Chicago. The company will ship from 3 to 5 car loads of mica per month from mica mines near Custer.

Iron Mountain Gold Mining Company.—This company has been organized at Custer with a capitalization of 500,000 shares at $1 per share. The directors are: J. L. Logan, Cincinnati, O.; W. W. Hinton, Covington, Ky.; Samuel Scott, Custer, S. D. The company proposes to work mines in South Dakota and elsewhere. Iron Mountain is on the line between Custer and Pennington counties, 12 miles north of Custer. The company intends to make regular shipments of iron ore to the smelters at Omaha and Denver for fluxing.

Lawrence County.

From Our Special Correspondent.)

American Mining Company.—This company, which is running a 4,500-ft. tunnel under Ragged Top, is reported to have leased the Old Anna Mine, at the junction of Annie and Spearfish creeks. A 100-ton cyanide plant is to be erected.

Homestake Company.—Work is pushed on the 1,000-ton cyanide plant. The building is to be 400 ft. long and 250 ft. wide. The stone foundation is nearly completed. Several carloads of steel piping have arrived from St. Louis for the Spearfish water ditch.

Omaha Milling and Mining Company.—This company has been organized to float the Ogden process for reducing ores by magnetism. The officers of the company are: President, S. A. Flower, Deadwood; vice-president, Lewis Wentworth, Omaha; treasurer, C. H. Cornell, Valentine, Neb.; secretary and general manager, J. A. Ogden, Deadwood. Custom ores will be treated.

Original Hardin.—This mine is worked with a full force of men. A new body of pyritic ore has been encountered. Nineteen 4-horse teams are hauling ore.

Shawmut Gold Mining Company.—This company, which has purchased the Esmeralda Mine and Mill, in Blacktail District, is preparing for extensive work this season. Edison E. Dewey, president of the company; B. J. Heath, treasurer, and Walter P. Farmer, vice-president, all of Boston, are in Deadwood.

Titanic Mining Company.—This company has purchased an engine and boiler, and a steam hoist will be ordered. The company has nearly reached lower quartzite. The company is getting the tract patented.

Pennington County.

(From Our Special Correspondent.)

British-American Company.—Men are at work on this company's copper ground west of Rochford. Work on the long tunnel will begin May 1st.

Fairview.—A shaft has been sunk at the Fairview Mine 200 ft. and 200 ft. of drifting has been done. A test run is being made on ore at the Cuttysark 10-stamp mill. Eastern parties are negotiating for the mine.

Golden Slipper.—The owners of this mine, 4 miles east of Hill City, are keeping the water down, expecting to sell the property this spring to Eastern parties. The main shaft is down 290 ft. on a fissure vein, showing free milling gold.

Holy Terror Mining Company.—Five new stamps have been added to the Holy Terror 10-stamp mill and 6 new 6-ft. Frue vanner concentrating machines have been put into the Keystone Mill. This increases the capacity of both mills to about 140 tons per day. The Keystone Mill is working ore from the Keystone Mine and the Holy Terror Mill ore from the Holy Terror Mine.

Standby.—Two shifts are running the tunnel in the Standby Mine, at Rochford. The tunnel was carried 900 ft. last winter and it is expected that 300 ft. more will reach the main ledge of ore.

Uncle Sam.—The shaft in this mine is down nearly the extra 100 ft. and drifting will begin this month to catch the incline. The stamp mill has been repaired. The mine is owned by the Clover Leaf Mining Company, of Montana.

UTAH.

From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week ending April 21st the different smelteries sent forward 18 cars, or 760,853 lbs., lead-silver bullion; 4 cars, or 203,399 lbs., copper bullion. In the same week there were shipped from the different camps to smelteries beyond the State 79 cars, or 3,313,495 lbs., lead-silver ore, and 3 cars, or 180,458 lbs., copper ore.

Germania Smelter plant.—Affairs at the Germania plant, of the American Smelting and Refining Company, are moving along very much as formerly. On April 19th the fourth large lead stack was blown in, making the full complement, according to the schedule of the past winter.

Juab County.

From Our Special Correspondent.)

Tintic Shipments.—For the week ending Saturday, April 21st, the shipments from the 3 railroad points of the district were 101 cars of ore and 3 cars of concentrates, as follows: Centennial-Eureka, 38 cars; Mammoth, 13 cars ore, 3 cars concentrates; Swansea, 10 cars; Gemini, 9 cars; Grand Central, 7 cars; Bullion-Beck, 5 cars; Carissa, 5 cars; Uncle Sam, 5 cars; South Swansea, 4 cars; May Day, 3 cars; Godiva, 2 cars.

Alaska.—Superintendent Talbot is confident that the Alaska is soon to be a producing mine. A shaft is down 400 ft. and good headway is being made. Annual meeting occurs on May 4th.

Centennial-Eureka.—President Robert D. Evans, in company with Managing Director Holden, Messrs. Stillman D. Kelley, W. B. Devereux and Richard A. Parker, visited the property on April 18th last. President Evans expressed himself as well satisfied of the ability of the mine to maintain the present production for a long period.

Mammoth.—On April 21st, on north drift from 1,900 level, about 140 ft. from the shaft, an ore body was cut. At 1,800 workings the ore shoot in places was 100 ft. wide. An hour later a drift from 800 level broke into an ore body represented to be the continuation of the famed Betsy and Cunningham stopes. President-Manager McIntyre is examining the finds, which are called the most important made in the district for a 12-month.

Salt Lake County.

From Our Special Correspondent.)

United States.—A tempest in a teapot is raging over the resignation of General Superintendent James W. Neill, conditioned on the appointment of A. F. Holden as managing director. In Boston, New York and Utah this change has been an open secret since the upset following the failure of the Globe National Bank. Mr. Robert D. Evans left Salt Lake for Boston on April 20th and he had Mr. Neill's resignation to present to the reorganized directorate.

Summit County.

From Our Special Correspondent.)

Park City Shipments.—In the week of April 21st the total smelter products forwarded from the camp was 2,042,240 lbs., to be credited as follows: Silver King, crude, 1,066,555 lbs.; concentrates, 337,015 lbs.; Daly-West, crude, 362,855 lbs.; concentrates, 275,815 lbs. In addition, there was shipped through the Mackintosh sampler a lot of silver sulphides from the Marsac Mill, of 7,399 lbs.

Daly.—President Chambers is at San Francisco, and when he returns to Utah it is expected that steps will be taken to resume mining.

Tooele County.

From Our Special Correspondent.)

Daisy.—During the coming week steps will probably be taken to foreclose the trust-mortgage for $25,000. It is said the minority stockholders on April 25th or 26th will hold a meeting to consider the practicability of having a receiver appointed.

Hercules.—A promising seam of galena was cut in this Stockton property a few days since in an upraise driven for air.

Honorine.—Exploration progresses favorably. The compressor will not be in commission again till the end of the month.

VERMONT.

Bennington County.

Ochre Mines.—The deposit of ochre 1 mile west of Bennington has been worked for nearly 60 years. The ochre is broken easily with pick and shovel and wheeled to the mill, where it is shovelled into a large revolving wooden cylinder through which a 4-in. stream of water runs. The ochre is washed and reduced to silt. It flows through a broad trough where all sand is deposited. When the sediment is removed from this vat quartz crystals are frequently found, perfect, transparent and sometimes 4 in. in length. The ochre flows through a fine strainer into another vat where the little clay it contains is deposited, then through 10 rods of wooden troughs and empties into an earthen vat several rods square. Here the water moves so slowly that most of the ochre settles; that which the water holds in suspension is usually deposited by the time it has flown through 3 vats. When the ochre is running pure and very fine deposition takes place so slowly that valuable portions are still held in suspension by the waste matter flowing from the last vat. To secure this some lime is added which hastens the precipitation. When the vats are filled the stream is turned into empty ones. After standing for several days the water is slowly drawn off from the top and the ochre paste is permitted to dry. It is next cut out with a shovel and placed on racks in long sheds with open sides,

where the free circulation of air dries it into hard lumps. Finally it is ground to an impalpable dust. It is then put into barrels and is ready for the market.

WASHINGTON.

Okanogan County.

Okanogan Free Gold Mines.—The former company is to be reorganized, the increased capital amounting to $200,000. The new company is organized on the assessment plan. T. Mayne Daly is president, and K. K. Peiser is secretary.

FOREIGN MINING NEWS.

CANADA.

British Columbia—East Kootenay District.

From Our Special Correspondent.)

North Star.—J. L. Parker confirms the report of a rich strike. The lead was recovered after cross-cutting. The management is shipping 75 tons daily.

St. Eugene.—The concentrator is treating 150 tons of ore daily.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Rossland Ore Shipments.—The output of ore from January 1st to April 20th for Rossland amounted to 35,000 tons.

British America Corporation.—At the Nickel Plate the shaft is down 500 ft., and further work has stopped until the timbering is completed. At the No. 1 sinking below the 400-ft. level continues, and a large amount of development work is being done. The management is now installing a 450-H. P. electric hoist. At the Josie a winze is being sunk from the 300-ft. level, and the gravity tramway for shipping ore to the line of the Red Mountain Railway is nearly completed. A railway siding is to connect with the tramway. At the Columbia & Kootenay the workings are 800 ft. below the outcrop on the surface. Six tunnels have been run into the mountain. The different levels will be worked from the shaft. No report is furnished as to the quantity of ore in sight.

Center Star.—The new compressor building is 60 by 30 ft. The concrete foundation is now set. This foundation cost about $5,000, and the building $2,000. The compressor capacity is 40 drills. The plant was manufactured by the Jencks Machine Company of Sherbrooke, Que. The plant will not be shipped until May 5th.

Center Star.—The management of this Rossland mine is at present working only 4 drills.

Iron Mask.—The east shaft is down 240 ft. and the west shaft is sunk 450 ft. Both are being sunk to the 500-ft. level.

Le Roi.—The management is now working 275 men in the mine. Shipments of ore were resumed at the rate of 12 cars daily.

Sunset No. 2.—Development work under William H. Jeffery is confined to shafts Nos. 2 and 3, with drifting and cross-cutting. No. 3 shaft is down 100 ft. The west drift, on the vein, which is 8 ft. wide, has been continued for 260 ft. In the crosscut from No. 2 shaft 5 distinct ore stringers have been cut, carrying gold, copper and iron. About 800 ft. of development work has been done since January 1st this year.

War Eagle.—Seven drills are at work in this Rossland mine.

Nova Scotia—Guysboro County.

(From Our Special Correspondent.)

Blue Nose.—This mine in Sherbrooke District returns for January 1,156 tons rock, 368 oz. gold; February, 1,200 tons rock, 381 oz. gold; March, 1,250 tons rock, 411 oz. gold.

Forrest Hill returns for February and March are 1,400 tons rock, 460 oz. gold. Hurricane Point returns for March, 350 tons rock, 135 oz. gold.

Modstock.—This mine in Sherbrooke District for February returns 500 tons 212 oz.

Richardson.—This mine in Stormont District keeps up its steady returns, gradually improving. March output was 2,400 tons of ore yielding 536 oz. of gold against 2,000 tons 365 oz. for February. Twenty stamps are to be added to the mill in the near future.

Wine Harbor District.—The Guysboro Company returns 63 oz. from 70 tons of ore.

Nova Scotia—Queens County.

(From Our Special Correspondent.)

Philadelphia.—This mine returns 275 oz. from 1,775 tons of ore.

Jubilee.—This mine in Renfrew District was opened some 18 months ago. It has worked but a few months, using hand and horse power. The entire working belt is 4 ft. wide, but 40 ft. of sinking has been done and stoping from 7 to 20 ft. either side of the shaft. Altogether but 1,000 cu. ft. of rock has been taken out, from which the extraordinary amount of $30,000 worth of gold has been extracted, $30 for every cubic foot of rock broken. It is reported the last shot in the bottom of the shaft exposed $4,000 worth of gold. This property is again under bond for $37,000. The owners are 4 workingmen.

Ontario—Hastings County.

Atlas Arsenic Company.—The first 15 days' run of this company's plant at Deloro resulted in a gold brick weighing 7 lbs. The tailings were roasted to get the arsenic, and then treated by cyanide for the remaining gold product.

Ontario—Lake of the Woods District.

(From Our Special Correspondent.)

Imperial.—Work has suspended pending a mill run on the ore. The shaft is down 115 ft., with 40 ft. of drift. A crosscut of 60 ft. was made at one point to cut another vein, but the vein was not met. The main vein is from 1 to 3 ft. wide. At the surface the vein was only a few inches wide, and it is close to the contact of the granite and trap. The property is on Shoal Lake.

Independence and Eclipse.—These properties, formerly owned by the Manitou Lake Gold Mining Company, Limited, have been sold by the company to pay its indebtedness. Detroit parties are the purchasers. These properties were boomed about a year ago, and a large amount of money raked in by the sale of stock. The holders must now be a disgusted crowd. N. C. Westerfield, the promoter, has not been seen in Rat Portage for a long time. The development of this property into a paying mine was looked upon as a foregone conclusion.

Mikado.—A new 300-ton Blake crusher from the Gates Iron Works has arrived at Rat Portage for this mine.

Orion Gold Mining Company.—A special general meeting was held in Rat Portage on April 11th. The meeting unanimously decided that the company's properties should be transferred to Mr. Otto Taubert, of St. Paul, Minn., in consideration of his paying the outstanding liabilities. At a sale under execution of some of the leaseholds, Mr. Taubert was the purchaser at $3,000. It was supposed that Mr. Taubert will incorporate a new company and issue treasury stock to all the present shareholders.

COAL TRADE REVIEW.

New York. April 27.

Anthracite.

About the only event of importance to note this week in the anthracite trade is the opening of lake navigation, but this event is of no such importance as was the case last year. There is considerable coal on hand at the head of Lake Superior. At Chicago the high lake freights may lead to coal going on by rail later, there being apparently no great immediate demand. What coal is going from Buffalo seems to be well distributed among lower and upper lake ports.

Trade in the East is quiet, but with the passing of May 1st and the tax assessor at Boston a considerable amount of coal is likely to go to that port. At New York and Philadelphia buying is limited. The opening of navigation on the canals means a considerable movement of coal to inland points.

Producers continue to restrict production and prices are no weaker than they have been. In fact, the real test of this year's trade will not come for some months yet, probably not before August. So far producers have not fared badly.

Scattered strikes at the collieries are noted, but it looks as though the miners were not organized well enough for the labor leaders to attempt a general strike.

The New York Railroad Commissioners have granted the promoters of the Delaware Valley & Kingston Railroad permission to build along the abandoned Delaware & Hudson Canal. The Erie and the New York, Ontario & Western, however, seem determined to carry the matter into court, and there are difficulties to be settled in Pennsylvania. Altogether it is probably safe to say that work on the road will not begin this year.

We quote free burning anthracite f. o. b. New York Harbor as follows: Broken, $3@$3.20; egg, $3.30@$3.50; stove, $3.60@$3.70; nut, $3.60@$3.70; pea, $2.40@$2.75; buckwheat, $2.10@$2.30.

Bituminous.

The Atlantic seaboard soft coal trade shows a considerable demand for coal, but the supply seems to keep pace with the demand. Prices are slowly receding from the figures named just after the George's Creek strike was declared, and the situation verifies the idea that car supply is the controlling factor in the market. The cars used in the George's Creek region have got coal from collieries elsewhere, allowing Clearfield or other districts to supply all necessities.

In the far East prices are weak. A number of cargoes are on the market at Boston and find takers scarce. Speculative prices for coal there have receded from $4.25@$4.50 to $3.50, and there is a good probability that they will be lower before they are higher. Speculators in the coal market have fared badly of late. Along the Sound some consumers are in short supply, but we hear of none being obliged to shut down. The New York harbor trade has felt the strike least, consumers here being seemingly in a position, so far as their storage facilities permit, to wait for coal. Many of them, however, could take more if conditions were different. Consumers in the all rail trade are thought to have fair stocks on hand, and, judging from appearances, are not suffering.

Regarding the George's Creek strike, it is evident that the conservative element among the miners is coming to the front. The operators have not changed their united opposition to the demands of the organizers, and it is understood that there is a movement at the mining towns to bring the miners and operators together without outside interference. The miners have shown commendable spirit in refraining from all acts of violence. Some Meyersdale miners have returned to work at 55c. per ton, on the condition that they shall get 60c. if the George's Creek men get that. It is to be remembered that the Clearfield miners who get 60c. have narrow seams of coal to work and but a small part of them are pick men, while opposite conditions prevail in the George's Creek District.

Transportation from mines to tide is better, but not up to the mark. Car supply is fair. In the coastwise vessel market vessels are scarce and in fair demand. Shippers continue to have difficulty to get vessels for particular business. Ocean freights from Philadelphia are: Boston, 80 @85c.; Providence, New Bedford and the Sound 70@75c.

Clearfield coal is now quoted at $2.65@$2.85 f. o. b. New York Harbor ports.

Birmingham, Ala. April 23.

(From Our Special Correspondent.)

The Alabama coal market is prosperous and every ton of coal mined finds a ready sale. Excessive rains have interfered with the output and of course was followed by hurry work. Mines which suffered were at Pratt City, Brookwood, Blocton, Belle Ellen, Brookside, Tuscaloosa and elsewhere.

Coal men anticipate a steady demand through the year, with a better price the coming Fall. Though cold weather is past, there has been no decrease in demand. The business to Alabama and Florida ports is growing steadily with no signs of abatement. Mississippi River trade is holding its own.

Chicago. April 22.

From Our Special Correspondent.)

Anthracite Coal.—Business in anthracite coal has been very slow during the past week, sales being limited to small lots. The mild weather and the uncertain prices both tend to produce a slow market. Coal is beginning to arrive by lake, a few boat loads having come to date. The circular quotations are still $5.75 for egg and stove, and $6 for chestnut.

Bituminous coal is in better supply than demand. Business during the week has not been large. There is much competition among dealers for the trade, and prices are likely to go lower.

Cleveland, O. April 26.

(From Our Special Correspondent.)

The transportation market has been without sensational features during the week. Coal cargoes were rather scarce during the latter part of last week, owing principally to the miners' strike in the Pittsburg district, but with the plentiful supply of cars which had accumulated the movement is now satisfactory. The rates seem to have been pretty firmly established at 50c. to the head of Lake Superior, 60c. to Manitowoc and Sheboygan and 65c. to Milwaukee. No effort has as yet been made to break these rates and there is little reason to believe that any will be made for some time. The phase of the lake coal situation which is now attracting most attention is in the operations of the Pittsburg Coal Company. The dock interests of the company include 4 car dumpers and 3 steamboat fuel lighters at Cleveland; 1 car dumper and a lighter at Fairport; 1 car dumper and a lighter at Ashtabula; a car dumper and fuel pockets at Erie; docks and pockets at Sandwich and Amherstburg on the Detroit River; docks and pockets at Detour on the Sault River and also at Sault Ste. Marie.

Pittsburg. April 25.

From Our Special Correspondent.)

Coal.—There is but little change in the coal situation. The committee of the miners' organization and the two coal combinations were unable to come to an agreement at the last conference, and another one has been arranged for to-morrow. The miners were all ordered to continue at work pending the result of this conference. There are a number of differences that have caused suspensions at several mines, but the idleness of these does not have much effect on the output. National President John Mitchell, of the United Mine Workers, announced that unless a satisfactory arrangement can be made of the pay for outside day labor a general strike will be ordered in the Pittsburg District. About 1,500,000 bus. of coal were shipped to Southern ports during the week. There are about 3,000,000 bus. loaded and ready to go out, but the water in the rivers is too low to make any further shipments.

Connellsville Coke.—The flurry in iron and steel markets did not have any affect on coke prices, and furnace coke is still quoted at $4@

$4.25, and foundry at $4.25@$4.50. The heavy output continues, but the production and shipments fell off slightly last week. Of the 20,140 ovens in the region 492 are idle. The production was 217,556 tons, a decrease of 306 tons. The shipments aggregated 11,949 cars, distributed as follows: To Pittsburg and river tipples, 3,222 cars; to points west of Pittsburg, 6,212 cars; to points east of Connellsville, 2,515 cars. This was a decrease of 237 cars compared with the previous week.

Shanghai, China March 22.

(Special Report of Wheelock & Co.)

Coal.—We have a large stock of common kinds of Japan coal, but for good coal the market is firm. At auction some 3,000 tons were sold at 3.55@5.45 taels per ton. No demand for Australian Wollongong or Welsh Cardiff. Arrivals of all kinds of coal during the fortnight were 14,816 tons. We quote per ton as follows: Welsh Cardiff, 20.50 taels; Sydney Wollongong, cargo, 13 taels, and other sorts, 6.50@7 taels; Chinese Kaiping, lump, 7@8 taels; dust, 4.50 taels, and mixed 5@5.75 taels. Japan, all contracted for.

Kerosene Oil.—American is very quiet. A considerable quantity is being shipped to Tientsin. Langkat and Batum are also quiet. Stocks are 824,000 cases American; 466,710 cases Batum, and 88,000 cases Langkat; total, 1,378,710 cases. We quote per case as follows: American Devoe's, 2.27½ taels; Russian Batum Star & Crescent, 2.10 taels, and Ran Chop, 2.11 taels, and bulk oil, 2.16 taels; Sumatra Langkat, loose, 1.67 taels, and Dragon Chop, 2.08 taels.

SLATE TRADE REVIEW.

New York. April 27.

Sales agents of roofing slate report more orders at satisfactory prices. With the resumption of work at the larger quarries dealers anticipate lower prices, as in some districts quarrymen will greatly increase their output. Mill stock people are taking some good orders for future delivery, and school slates are being exported, though in less quantity than last year. The shipments of slate from Slatington and Walnutport, Pa., for the 19 days ending April 19th are compiled by us as below, comparison being made with the same time in March:

	Mar. 1-19.	Apr. 1-19.	Changes.
Roofing, sqs.....	8,322	11,324	I. 3,002
School slates, cases..	528	342	D. 186
Blackboards, crates.....	617	336	D. 281

Export trade continues to decline, while freight rates remain at 15s. to London, and correspondingly high to other ports.

The list of prices per square for No. 1 slate, standard brand, f. o. b. at quarries in carload lots, is given below:

Prices of Roofing Slate.

Size, inches	Monson or Br'nville.	Bangor.	Bangor Ribbon.	Alb'n, or Jackson Bangor.	Lehigh.	Peach Bottom.	Sea Gr'n.	Unfad'g Green.	Red.
	$	$	$	$	$	$	$	$	$
24 x 14	6.10	3.50	3.00	3.25	3.10	5.10	3.15	..	.....
24 x 12	6.60	3.50	3.00	3.25	3.10	5.25	3.15	3.75	.....
22 x 12	6.60	3.50	3.25	3.50	3 25	5.25	3.15	3.75	.....
22 x 11	6.50	3.75	3.25	3.50	3.25	5.25	3.15	4.00	.....
20 x 12	6 90	3.75	.....	3 50	3.25	5.25	3.15	3.75	.....
20 x 11	6.80	.....	.....	3.75	3.50	5.25	3.15	.....	.....
20 x 10	6.80	4.50	3.50	3.75	3.50	5.35	3.15	4.25	11.00
18 x 12	6.80	3.75	.....	3.50	3.25	5.25	3.15	3.50	.....
18 x 11	7.00	.....	.....	.....	.....	.....	3.15	3.75	.....
18 x 10	7.20	4.50	3.50	3.75	3.50	5.35	3.15	4.00	11.00
18 x 9	7.10	4.50	3.50	3.75	3.50	5.35	3 15	4 25	11.00
16 x 12	6.80	3.75	.....	3.50	3.50	.....	2.95	3.50	.....
16 x 10	7.10	4.25	3.50	3.75	3.50	5 25	2.95	4.00	11.00
16 x 9	7.00	4.25	.....	3.75	.....	5.35	2.95	4.25	11.00
16 x 8	7.20	4.50	3.50	3.75	3.10	5.35	2.95	4 25	11.00
14 x 10	6 60	3.75	3.25	3.25	....	5 25	2.85	3.75	11.00
14 x 9	6.50	.....	.....	.....	.....	.....	2.85	3 75	11.00
14 x 8	6 60	3.75	3.25	3.25	3.10	5.10	2.85	4.25	11.00
14 x 7	6.40	3.75	3.25	3.25	3.10	5.10	2.60	4.25	11.00
12 x 10	5.80	.....	....	....	.....	...	2.60	3.25	....
12 x 9	5.60	.....	...	.....	.....	....	2.60	3.25	.....
12 x 8	5.50	3.50	.....	3.00	2.80	4 85	2.60	3.50	9.50
12 x 7	5.00	3.25	.....	3.00	2.80	4.85	2.50	3.50	9.50
12 x 6	4.80	3.25	...	3 00	2.80	4.75	2.50	3 50	9.50

A square of slate is 100 sq. ft. as laid on the roof.

In Brownsville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3-16 in. Intermediate sea green, $2.35@$2.55; purple, $3.50@$4.25; purple variegated, $2.50@$3.15; red variegated, $6@$8 per square, according to size.

IRON MARKET REVIEW.

New York, April 27, 1900.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending Apr. 28, 1899 F'ces.	Tons.	Week ending Apr. 27, 1900. F'ces.	Tons.	From Jan., '99. Tons.	From Jan., '00. Tons.
An'racite & Coke.	188	242,059	260	283,350	3,939,327	5,494,326
Charcoal.	17	4,925	29	7,025	85,383	141,525
Totals..	205	246,975	289	290.375	4,024,710	5,635,851

The American Steel and Wire Company, having done its best to limit business by excessively high prices, has gone to the other extreme and made cuts varying from $18 to $20 per ton on wire and nails. This action has been the general topic of discussion in the trade. A few think it is the forerunner of general demoralization and predict a heavy drop in prices all around; but the general opinion is against them. No doubt prices have been too high in some directions, and a general readjustment, with some reductions, will do no harm. Business is generally sound and consumption very large, with the chance that it will be larger yet if lower rates can be had on certain lines. There is export trade enough offering to be a steadying factor in the market. It is to be remembered that practically very little was done at the top prices, and reductions so far made have been little more than nominal.

Trade has naturally been quiet during the week, as new orders are not likely to be placed until the market has steadied itself. There is plenty of work in sight, however, and no reason for discouragement.

Notes of the Week.

Exports of iron and steel from Great Britain for the three months ending March 31st are valued as below:

	1899.	1900.
Iron and steel.....	£5,473,155	£8,269,800
Machinery	4,515,360	4,764,901
New ships.....	2,224,289	1,194,918
Total.....	£12,212,804	£14,229,619

The total increase this year was £2,016,815, or 16.5%. There were large gains in finished iron and steel and in machinery; but a heavy decrease in new ships.

Birmingham, Ala. April 23.

(From Our Special Correspondent.)

Furnacemen in this locality claim that there are no reasons why there should be any weakness in price. The only concern felt during the past week or 10 days has been about the large rainfall, shutting off the supply of coal, coke and ore. As a consequence, three or four furnaces banked their fires and others reduced their production. For more than 3 days the production of pig was greatly reduced.

There has been more or less discussion of the recent action of the steel men in the West, which threatened injury to the steel and iron markets, but, as far as can be learned, it has had no effect on conditions hereabouts.

The Sloss Iron and Steel Company had 2 furnaces at North Birmingham banked during a couple of days last week. The Tennessee Coal, Iron and Railroad Company got about half output from the 4 furnaces at Ensley. The Williamson furnace in Birmingham suffered also from the rains. Shipments have been disturbed also, the railroads being troubled by high water.

The steel plant at Ensley is working 6 furnaces out of the 10 steadily. The steel wire and rod mill has started and has a supply of rods on hand preparing for the full operation of the nail machines. The first shipment of nails occurred the past week; the Mayberry Hardware Company, of Birmingham, will be distributing agents for the plant.

The following are the pig iron quotations: No. 1 foundry, $18.50; No. 2 foundry, $17.50; No. 3 foundry, $16.50; No. 4 foundry, $16@$16.50; gray forge, $16; No. 1 soft, $18.50; No. 2 soft, $17.50.

Buffalo. April 25.

(Special Report of Rogers, Brown & Co.)

The opening of the Erie Canal, which took place this week, is proving a slight stimulus to business in this locality, a number of buyers having waited to take advantage of the lower cost of transportation which this affords to all consuming points along its line and on the Hudson River. Aside from this there is very little new in our local pig iron market. A disposition to hold off from buying still continues, new business being confined almost exclusively to orders for prompt shipment. The demand of late has been chiefly for the better grades of foundry iron, which still remain well sold up, so that concessions are more likely to be had on Nos. 3 and 4 than on other grades. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $23; No. 2, $22.50; Ohio strong softener No. 1, $23.50; No. 2, $23; Jackson County silvery, 8%, $30; Southern soft No. 1, $23.50; No. 2, $22.50; Lake Superior charcoal, $26; coke malleable, $23.

Chicago. April 23.

From Our Special Correspondent.)

Pig Iron.—The buying of pig iron has increased somewhat, orders being more numerous and larger quantities are being asked for. The Pullman Car Company and others have bought during the week. There are some good-sized orders to be placed soon. The flurry in the steel stocks doubtless has tended to keep business out of the market. Prices are about as last quotations, which are: Lake Superior charcoal, $25.50@$26.50; local coke foundry No. 1, $24.50@$25; No. 2, $23.50 @$24; No. 3, $22.50@$23; local Scotch No. 1, $25@ $25.50; Ohio strong softeners, $24.50@$25.50; Southern silvery, according to silicon, $25.50@$27; Southern coke No. 1, $22.85@$23.35; No. 2, $21.85@ $22.35; No. 3, $20.85@$21.30; Southern No. 1 soft, $22.85@$23.35; No. 2 soft, $21.85@$22.85; foundry forge, $20.85; malleable Bessemer, $24@$25; coke Bessemer, $25@$26.

Cleveland, O. April 26.

(From Our Special Correspondent.)

Iron Ore.—Navigation on the great lakes is now open and within a few days the fleet of ore vessels will be fairly on their season's work. The opening has been characterized by two surprises. One was that despite fears to the contrary the first ore cargoes will arrive at the unloading ports on Lake Erie fully a week sooner than last year. Secondly, the "wild" or daily freight market has opened just a trifle weak, probably due to the general depression of the iron and steel market during the past week, combined with the fact that ore shippers at both ends of the route are having about all they can do to take care of their contract vessels. There is a plentiful supply of tonnage on the market. The first charters from Escanaba were made at 90c., or 10c. below the rate anticipated, while it is probable that the daily rate from the head of the lakes will open at $1.10. With the waiting condition in the iron market generally, there have been practically no sales of ore, and the outlook for an early opening of the market is by no means bright.

Pig Iron.—The market is as near absolute stagnation as possible at a time when there is so much business moving in other lines. The tendency to lower prices in all lines of manufactured iron and steel products and threatened labor troubles at several industrial centers are naturally making furnacemen very conservative. Outside a few carload lots, no transactions whatever are reported and there is a general belief that prices for both Bessemer and foundry grades will be shaved down unless there is a quick recovery. Nominally we continue quotations: Bessemer, $24 in the Valley; No. 1 foundry, $23; No. 2 foundry, $22.50; gray forge, $21.50; Lake Superior charcoal, $25.50.

Scrap.—The old material market is also stagnant or nearly so. There is little movement in any line and some grades are not selling at all. We quote: Steel melting stock, $21.75; No. 1 cast, $16.50; No. 1 wrought, $19.50; iron rails, $24.50; car wheels, $23.50; turnings, $13.50; borings, $12.

Philadelphia. April 27.

From Our Special Correspondent.)

Pig Iron.—Practically all pig iron quotations are withdrawn this week. Buyers have run away. Consumers having large contracts for pig are asking the makers to not ship any more for the present. All our brokers and furnacemen report about the same condition; a readjustment is in progress, and must take place on a basis of lower values. At the same time there is no demoralization. Consumption is heavy. While No. 1 X foundry is quoted at $23 and above, it can be had for less. No. 2 X is $21@$22; No. 2 plain, $20.50@$19.50. Basic, nominally $22, and Bessemer the same.

Billets.—All negotiations are off, and there is no business. A few days will likely lead to offers, because large consumers are willing to buy.

Bars.—Ordinary bars sold at 1.80@1.90 and 2c. for refined in small lots. Larger lots can be bought perhaps $2 per ton less.

Sheets.—Prices and demand keep up. Business is full of promise. No. 10 is 2.70c.; No. 28, 3.35c.

Merchant Steel.—Business has been slack for a few days. Our reports indicate a slothful Western market, with a weakening tendency, due to lowering raw material.

Pipes and Tubes.—The new business shows that buyers are not anxious to place large orders, as lower prices are expected.

Plates.—The great additions to capacity are now producing results. Negotiations opened 2 or 3 weeks ago are off. There will be some holding off until the present flurry is over. Sales are quoted at 1.90@2c. for ¼-in.; shell, 2.05@2.10c.; flange, 2.25@2.30c.

Structural Material.—No change. This is the strongest article on the list, as a good deal of business is coming in and the outlook is good. The basis is 2.40c. There will be a large amount of material contracted for in the near future.

Steel Rails.—No definite statement can be had concerning the rumors of a decline in rails, which to-day are quoted at $35.

Old Rails.—Old iron rails are $24; old steel rails, $23.

Scrap.—Scrap goes quickly at top prices, and seems to be the only thing not affected. Heavy steel scrap is all bought up at $22; choice railroad goes at $24; cast brings $13@$13.50; iron axles, $26.

Pittsburg. April 25.

From Our Special Correspondent.)

The action of the American Steel and Wire Company in cutting prices during the week caused quite a flurry in the iron and steel markets, and there is practically no business at all. A number of rumors are current as to cuts in prices of iron and steel, but all are with-

out foundation. There have been no reductions in prices due to the action of the Wire Company, but it has resulted in hesitation on the part of buyers. This may continue for about a month, when it is expected that confidence will again be restored and the market resume its former strong tone. It seems to be the unanimous opinion of consumers of pig iron that it will not decline in price unless the demand for finished material stops altogether. Among Pittsburg producers the general impression seems to be that within a month there will be a reaction that will result in prices being set above what they are quoted to-day. There were no inquiries or sales of Bessemer pig iron during the week, and the Bessemer steel billet market is in about the same condition. Foundry iron is weaker, and prices are lower than last week. Sheets and structural material are the strongest features of the iron and steel markets this week. A large local steel concern has just contracted to furnish about 10,000 tons of structural material for the Alliance Realty Company's building, in New York. The price is not given, but it is said the ruling rates were not shaded to any great extent. In the sheet steel business the conditions are unusually promising. No official announcement has been made of a change in prices. The matter is in the hands of the executive committee of the American Steel Sheet Company. This combination yesterday closed the preliminary negotiations for the purchase of the big plant of the W. Dewees Wood Company at McKeesport, the plant of the Wellsville Plate and Sheet Iron Company at Wellsville, O., and the site and machinery for the proposed Bessemer steel plant of the Woodson Steel Company on the Monongahela River above McKeesport. These three interests are controlled by the W. Dewees Wood Company. It is expected that the deal will be closed by May 1st. The McKeesport mills were shut down this evening to take an inventory of stock. The price to be paid was not made public, but it is understood to have been large on account of the valuable secrets, patents and processes for the manufacture of Russia sheet iron. There are now only two large concerns outside of the new sheet combine. They are Zug & Company, of Pittsburg, and the Whitaker Iron Company, of Wheeling, W. Va.

Pig Iron.—The market is unusually quiet, no sales of Bessemer having been made during the week. The price remains at $24 Valley, and $24.90 Pittsburg, with no immediate indications for a lower rate. Foundry iron is weaker and prices are lower than last week. No. 2 is quoted at $22.25, a drop of about 25c. a ton during the week. There is nothing doing in forge iron.

Steel.—Bessemer steel billets are lower this week, and are quoted at $32, a drop of 50c. There were no sales, and but little inquiry. A further decline is not anticipated. Open-hearth billets range in price from $35 to $36. Sheet bars are firm at $36. Plates have suffered another reduction, and are quoted this week at 1.80c., a cut of 0.10c. this week.

Sheets.—The sheet market is in good condition. Prices have not yet been changed, but an advance is expected. There is a good inquiry, but no sales covering an extended period are being made. No. 27 is quoted at 3.10c. and No. 28 at 3.20c.

Ferro-manganese.—The market remains in the same condition as last week, the price being $125 for small lots.

New York. April 27.

The iron market shows weakness in certain lines and, as a whole, is unsettled. It will probably be a waiting market for some weeks. In foreign trade we note shipments of $20,000 worth of mining machinery to South Africa; $150,000 worth of finished iron and steel; $35,000 worth of machinery, and $11,000 worth of car material to Australia; over $100,000 worth of agricultural machinery to France, and $25,000 of hoisting engines to Germany.

Pig Iron.—The market continues a waiting one, unsettled by reductions in prices of certain finished goods. So far as weakness has shown, it is mostly confined to Northern brands. We quote for delivery in July, Northern brands, tidewater delivery: No. 1X foundry, $23@$23.50; No. 2 $21.50@$22; No. 2 plain, $20.50@$21; Southern brands, New York delivery: No. 1 foundry, $22.50 @$23; No. 2 foundry, $21.50@$22; No. 1 soft, $22.50 @$23; No. 2 soft, $21.50@$22; No. 3 foundry, $21.25 @$21.50.

Bar Iron.—Quotations are still 2@2.10c. for large lots of common on dock; refined 2.20c., but bars can be had for less.

Plates.—We quote for large lots at tidewater: Tank, ¼-in. and heavier, 2@2.05c.; tank, 3/16-in., 2.10@2.15c.; shell, 2.20c.; flange, 2.30c.; marine, 2.40c.; firebox, 2.50c.; universals, 2.10@2.15c. These prices are shaded.

Steel Rails and Rail Fastenings.—The steel rail market continues firm, partly, no doubt, because rails have been all along relatively lower than other finished products, and foreign inquiries are numerous. We quote for standard sections $35 f. o. b. Eastern mills. Smaller rails are quoted: 12-lb., $40; 16-lb., $40; 20-lb., $40; 30-lb. to 40-lb., $38; 40-lb. to standard, $36, with the usual advance for small orders. We quote angle bars, 2.30c.; fish plates, 2.30c.; spikes, 2.70c.

Structural Material.—The largest local order placed during the week was for 10,000 tons with the Carnegie Company for the Alliance Realty Building. Other good-sized orders are pending. Prices are generally without change. We quote in large lots at tidewater: Beams, 2.40@2.45c.; channels, 2.40@2.45c.; angles, 2.40c.; tees, 2.40c.

METAL MARKET.

NEW YORK, April 27.

Gold and Silver.

Gold and Silver Exports and Imports
At all United States ports in March and year.

Metal.	March. 1899.	March. 1900.	Year. 1899.	Year. 1900.
GOLD.				
Exports	$1,109 845	$1,064,350	$3,433 258	$8,159.298
Imports	3,187,575	1,921,036	14,728,825	5,808,536
Excess	I. $2,077,730	I. $ 856,686	I. $11,295,567	E. $2,350,762
SILVER.				
Exports	5,057 653	5.452,422	14,757,533	15,006,265
Imports	3,125,859	3,149,146	7,681,738	8,065,576
Excess	E. $1,931,794	E. $2,303,276	E. $7,075,795	E. $6,940,689

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

Gold and Silver Exports and Imports, New York
For the week ending April 26th, 1900, and for years from January 1st, 1900, 1899, 1898, 1897.

Period.	Gold. Exports.	Gold. Imports.	Silver. Exports.	Silver. Imports.	Total Excess, Exp. or Imp.
We'k	$1,108,951	$68,501	$482,200	$90,805	E. $1,431,845
1900..	4,094,085	1,270,124	12,260,173	1,404,383	E. 13,679,751
1899..	1,638,863	5,320,436	9,163,516	981,694	E. 4,588,249
1898..	4,426,939	64,464,897	13,065,963	1,622,093	I. 48,594,088
1897..	7,162,387	1,442,103	15,176,228	839,391	E. 20,057,111

Exports of gold were to Porto Rico and the West Indies; imports were in small lots. Exports of silver were chiefly to London; imports were from the West Indies and South America.

The United States Assay Office in New York reports the total receipts of silver at 78,000 oz. for the week. Total since January 1st, 1,768,000 oz.

Average Prices of Silver per oz. Troy.

Month.	1900. Lond'n Pence.	1900. N. Y. Cents.	1899. Lond'n Pence.	1899. N. Y. Cents.	1898. Lond'n Pence.	1898. N. Y. Cents.
January...	27.30	59.30	27.42	59.36	26.29	56.77
February..	27.49	59.76	27.44	59.42	25.89	56.07
March.....	27.59	59.81	27.48	59.64	25.47	54.90
April.....	.....	.....	27.65	60.10	25.95	56.02
May.....	.....	.....	28.15	61.23	26.31	56.98
June.....	.....	.....	27 77	60.43	27.04	58.61
July.....	.....	.....	27 71	60 26	27.32	59.06
August....	.....	.....	27.62	60.00	27 48	59.54
September	.....	.....	27.15	58.89	28.05	60.68
October ..	.....	.....	26.70	57.98	27.90	60.42
November	.....	.....	27 02	58.67	27.93	60.60
December.	....	.....	27.21	58.99	27.45	59.42
Year....	.....	.....	27.44	59.58	2.76	58.26

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Average Prices of Metals per lb., New York

Month.	Copper. 1900.	Copper. 1899.	Tin. 1900.	Tin. 1899.	Lead. 1900.	Lead. 1899.	Spelter 1900.	Spelter 1899.
Jan.....	15.58	14.26	27.07	22.48	4.68	4.18	4.65	5.34
Feb.....	15.78	17.02	30.58	24 20	4.675	4.49	4.64	6.28
March...	16,29	16.35	32,90	23.82	4.675	4.37	4.60	6.31
April....	.....	17.13	.....	24.98	.....	4.31	.....	6.67
May.....	.....	17.20	.....	25.76	.....	4.44	.....	6.88
June.....	.....	16.89	....	25 85	.....	4.43	.....	5.98
July.....	.....	17.10	.....	29.63	.....	4.52	.....	5.82
August..	...	17.42	.....	31.53	.....	4.57	.....	5.65
Sept.....	.....	17 34	.....	32 74	.....	4.58	.....	5.50
October..	.....	16.94	.....	31.99	.....	4.575	.....	5.32
Nov.....	.....	16.49	....	28.51	.....	4.575	.....	4.64
Dec.....	.....	15.85	.....	25.88	.....	4.64	.....	4.66
Year.....	.....	16.67	..	25.12	.....	4.47	.....	5. 75

Commencing with March 17th, the prices given in the table for copper are the averages for electrolytic copper; this is the case for both 1899 and 1900. The average price for Lake copper for the year 1899 was 17.61c. For January, 1900, the average price of Lake copper was 16.33c.; for February, 16.08c.; for March, 16.55c.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$ .47¾	$ .49
Peruvian soles and Chilean pesos	.44	.46
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.90
Twenty marks	4.75	4.88
Spanish 25 pesetas	4.78	4.82

Financial Notes of the Week.

High money rates in London have led this week to small exports of gold, and more is likely to follow soon. The inducements are sufficient to draw the money, and we have at present plenty of gold to spare. It will doubtless return in a few months.

The total amount of bonds presented to the United States Treasury for exchange into the 2% bonds issued under the new currency law has reached $251,448,800, of which $41,364,200 have come from other sources than national banks, and $210,084,600 have been bank bonds. It is evident, however, from the total of 2% bonds now pledged in the Treasury to secure circulation

Imports and Exports of Metals.

Port.	Week, Apr. 25. Expts.	Week, Apr. 25. Impts.	Year 1900. Expts.	Year 1900. Impts.
***New York.**				
Aluminum.....long tons	25	.....	42	2.
Antimony ore... " "	.....	**3	.....	989
" regulus.. " "	.....	**100	.....	397
Chrome ore..... " "	.....	.....	.....	151
Copper, fine ..... " "	2,188	745	34,907	7,863
" matte.. " "	496	.....	989	.....
" ore..... " "	.....	.....	.....	640
" ash..... " "	.....	.....	.....	41
Ferro-Chrome.. " "	.....	.....	.....	10
Ferro-mangan'se " "	.....	.....	.....	140
Iron ore ..... " "	.....	.....	.....	7,874
" pig, bar, rod " "	54	.....	2,045	1,458
" pipe..... " "	403	.....	4,404	124
" plates, sheets " "	22	.....	502	43
Lead..... " "	1,955	875	28,488	18,656
" ore..... " "	.....	.....	.....	7,300
" dross..... " "	.....	.....	.....	24
Manganese, ore. " "	.....	**3,300	.....	4,584
Metals, old, scrap " "	48	**262	1,194	3,330
Composition... " "	.....	.....	906	.....
Nails..... " "	283	.....	9 662	.....
Nickel ..... " "	40	.....	670	55
" ore matte " "	.....	.....	.....	2,821
§Railr'd material " "	.....	**75	435	1,442
Rails, old..... " "	.....	.....	206	518
Spiegeleisen..... " "	.....	**600	.....	1,300
Steel bars, plates " "	198	**835	3,005	7,549
" rails..... " "	.....	.....	13,676	18
" wire..... " "	676	.....	5,505	.....
" not speci'd. " "	23	**96	2,840	1,119
Tin ..... " "	.....	525	.....	8,966
" dross or ashes " "	.....	.....	3	.....
" and black plates" "	.....	‖541	.....	11,269
Zinc..... " "	.....	**3	.....	54
" dross..... " "	.....	.....	291	50
" ashes, skim " "	8	.....	456	20
" ore..... " "	2,510	.....	6,050	.....
†Baltimore.				
Chrome ore.....long tons	.....	.....	.....	2,930
Copper, fine..... " "	163	.....	16,385	1,703
" matte... " "	.....	.....	.....	.....
Ferro-manganese " "	.....	.....	.....	155
Iron pig, bar. etc. " "	263	320	1,303	11,849
" ore..... " "	.....	3,150	.....	178,522
" pyrites..... " "	.....	2,850	.....	14,743
Manganese ore.. " "	.....	.....	.....	71,897
Metals, old & Rails " "	.....	.....	384	.....
Nails ..... " "	14	.....	1,165	.....
Pipe, iron & steel " "	122	.....	1,831	.....
Spiegeleisen.. " "	.....	.....	.....	556
Steel, bars, etc.. " "	32	.....	708	419
" wire ..... " "	.....	.....	611	53
" rails..... " "	.....	.....	35,521	.....
Tin..... " "	.....	.....	.....	67
" and blackplates" "	.....	.....	.....	1,164
***Philadelphia.**				
Antimony .....long tons	.....	.....	.....	5
Chrome ore... " "	.....	‖200	.....	200
Copper, fine..... " "	201	.....	1,417	.....
" ore..... " "	.....	.....	.....	6,872
Iron, pig..... " "	.....	‖383	.....	486
" ore..... " "	.....	.....	.....	9,104
" pyrites..... " "	.....	.....	.....	87,455
Manganese ore.. " "	.....	‖2,900	.....	30,634
Spiegeleisen..... " "	.....	.....	.....	3,500
Tin..... " "	.....	.....	.....	143
" and black plates" "	.....	‖20	.....	1,530
Zinc ore..... " "	.....	.....	1,500	.....

Total United States.§§

Articles.	Feb., 1900. Expts.	Feb., 1900. Impts.	Year, 1900. Expts.	Year, 1900. Impts.
Antimony.....long tons	.....	411	.....	45.
" ore.... " "	.....	6	.....	348
Copper fine . " "	14,815	2,911	27.704	7,224
" ore & matte " "	705	1,148	1,080	3,270
Iron, pig & bar.. " "	9,559	9,071	19,554	15,948
" ore..... " "	.....	91,306	.....	181,021
Iron & steel plates " "	2,215	2.226	4,203	3,397
Iron & steel rails " "	18,315	.....	34,521	287
" " wire " "	5,314	122	11,606	239
Lead, pigs, bars & old ..... " "	9	1	39	12
Lead in ore, etc. " "	10,133	8,598	14,860	12,886
Manganese ore and oxide..... " "	.....	20,106	.....	55,362
Nickel " & matte " "	167	.....	298	.....
Nails, cut..... " "	517	.....	1,352	.....
" wire..... " "	4,279	.....	8,474	.....
Quicksilver..... " "	79	.....	107	.....
Steel, billets, rods, etc..... " "	2,370	2,458	6,461	7,050
Tin ..... " "	20	1,854	20	4,825
" & black plates " "	5	3,741	21	10.130
Zinc ..... " "	1,267	19	2,363	243
" ore ..... " "	2,008	.....	4,267	.....

*New York Metal Exchange returns. †By our Special Correspondent. §Not specified. **Week ending April 17th. §§ Monthly returns, Treasury Department. ‖ Week April 20th.

Import Duties on Metals.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, ¾c. a lb. Lead, 1½c. a lb. on lead in ores; 2½c. per lb. on pigs, bars, etc.; 2½c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1½c. per lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

or deposits in the national banks, amounting to about $229,000,000, that at least half of the private cases are cases where the bonds have been transferred to national banks after the delivery of the title.

The silver market has continued steady, with an advancing tendency, and closes higher at 27 7-16d. The demand for forward delivery at spot rates continues.

The statement of the United States Treasury on Wednesday, April 25th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week:

	April 18.	April 25.	Changes.
Gold	$86,164,271	$82,044,655	D $4,119,616
Silver	8,425,569	9,451 001	I 1,025 432
Legal tenders	8,862,793	10,023,189	I 1,160,396
Treas. notes, etc	679,349	657,778	D 21,571
Totals	$104,131,982	$102,176,623	D $1,955,359

Treasury deposits with national banks amounted to $111,577,718, a decrease of $5,365,101 during the week.

The statement of the New York banks—including the 63 banks represented in the Clearing House—for the week ending April 21st, gives the following totals, comparison being made with the corresponding weeks in 1899 and 1898:

	1898.	1899.	1900.
Loans and discounts	$572,646,800	$760,623,700	$767,473,300
Deposits	661,217,200	884,399,600	842,629,400
Circulation	14,079,900	14,028 000	21,390,100
Reserve:			
Specie	155,417,200	189,716,400	161,839,600
Legal tenders	53,412,200	55,559,400	63,712,100
Total reserve	$208,829,400	$245,275,800	$225,551,700
Legal requirements	165,304,800	221,099,900	210,657,350
Balance, surplus	$43,525,100	$24,175,900	$14,894,350

Changes for the week, this year, were increases of $5,800,900 in loans and discounts, $8,800,900 in deposits, $360,300 in circulation, $4,596,100 in specie, $1,423,200 in legal tenders, and $3,944,075 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding date last year:

Banks.	1899. Gold.	1899. Silver.	1900. Gold.	1900. Silver.
N.Y. Ass'd	$189,716,400	.....	$161,839.600	.....
England	154,901,320	.....	159,579,670	.....
France	363,360,360	$240,859,375	388,473,835	$226,371,855
Germany	148,125,000	76,310.000	127,460,000	65,660,000
Spain	58,270,000	61,705,000	68,445,000	78,025,000
Aus.-Hun	149,635.000	52,295,000	188.350.000	48,330,000
Neth'l'ds	19,175,000	34.155,000	24,350.000	29,455,000
Belgium	14,745,000	7,370,000	14,330.000	7,165,000
Italy	77,085.000	9,600,000	77.390,000	8,660,000
Russia	487,025,000	23,335,000	412,205,000	35,575,000

The returns of the Associated Banks of New York are of date April 21st, and the others are of date of April 19th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to April 11th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

	1899.	1900.	Changes.
India	£1,313 800	£1,439,368	I.£125,560
China	409,630	138,460	D. 271,170
The Straits	24,907	70,970	I. 46,083
Totals	£1,748,337	£1,648,810	D.£ 99,527

Arrivals for the week, this year, were £106,000 in bar silver from New York, £17,000 from the West Indies and £6,000 from Australia; total, £129,000. Shipments were £15,627 in bar silver to the Straits settlements.

Indian exchange remains about the same, and the small amount of Council bills offered in London sold at an average of 15.97d. per rupee. No silver is going to India at present.

The foreign merchandise trade of Great Britain for the three months ending March 31st is given by the Board of Trade returns as below:

	1899	1900.
Imports	£118 242,584	£127,078.536
Exports	78,294,681	88,923,358
Excess, imports	£39,,947,903	£38,155,17

The increase in imports was £8,835,952, or 7.5%; the increase in exports £10,628,677, or 13.6%; leaving a decrease of £1,792,725, or 4.5%, in the excess of imports. The movement of gold and silver for the three months is reported as follows:

	Imports.	Exports		Excess.
Gold:				
1900	£3,385,490	£8,010,031	Imp	£4,424,541
1899	7,000,737	7,022,912	Imp.	22,175
Silver:				
1900	3,370,115	3,034,346	Exp.	335,769
899	3,979,146	4,021,227	Imp.	42,081

Of the silver imported this year £2,625,588, or 86.5%, was from the United States.

Other Metals.

Daily Prices of Metals in New York.

April.	Sterling Exchange.	Silver. Fine oz. Cts.	Silver. London, Pence.	Copper. Lake, cts. ₩ lb.	Copper. Electrolytic ₩lb.	Copper. London, £ ₩ ton	Tin, cts. ₩ lb.	Lead, cts. ₩ lb.	Spelter. N. Y. cts. ₩ lb.	Spelter. St. L. cts. ₩ lb.
21	4.87¾	59⅝	27⅜	16⅞ @ 17	16¾	.....	31	4.67½	4.70	4.55
23	4.88	59⅝	27⅜	16⅞ @ 17	16¾	77½	30½	4.67½	4.65	4.55
24	4.88¼	59⅝	27⅜	16⅞ @ 17	16¾	77¾	30	4.67½	4.65	4.55
25	4.88¼	59¾	27 7/16	16⅞ @ 17	16¾	78	29¾	4.67½	4.60	4.50
26	4.88	59¾	27 7/16	67/8 @ 17	16¾	77¾	29½	4.67½	4.60	4.50
27	4 88	59¾	27 7/16	16⅞ @ 17	16¾	77¼	29½	4.67½	4.60	4.50

London quotations are per long ton (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—With the exception that the English Government is said to have placed an order this week for several hundred tons of copper, for prompt delivery, there is not much to report. The large reductions made by the American Steel and Wire Company at the end of last week have created rather an unfavorable impression, and consumers of all metals have refrained from placing new orders. In consequence thereof, while there has not been a pressure to sell from any side, quotations are not quite as firm as they were during the last few weeks. We quote Lake copper 16⅞@17c.; electrolytic in cakes, bars or ingots, 16¾c.; cathodes, 16½c., and casting copper nominal at 16⅝c.

The London market, which closed last week at £77 7s. 6d. for spot, £76 2s. 6d. for three months, opened at £77 10s. for spot, £76 for three months. It fluctuated within narrow limits early in the week and on Wednesday it was £77 12s. 6d. for spot, £76 15s. for three months. It closes at £77 5s. for spot, £76 5s. for three months.

Refined and manufactured sorts we quote: English tough, £80 10s.@£81; best selected, £81 10s.@£82; strong sheets, £88 10s.@£89; India sheets, £85@£85 10s.; yellow metal, 7¼@7⅜d.

Imports of copper into Great Britain for the three months ending March 31st were, in long tons:

	1899.	1900.
Ore	18,696	35,457
Matte and precipitate	20,572	22,579
Fine copper	15,149	19,437
Equivalent in fine copper	27,305	34,272

The increase in fine copper was 6,967 tons, or 25.5%. The United States furnished this year 163 tons ore, 1,922 tons matte and 8,777 tons fine copper.

Tin.—The market this week has been lower in sympathy with the decline in values in London and the marked pressure here to sell. Transactions were made as low as 29½c. At the close we quote spot tin at 29½c., May delivery at 29¼c.

The London market, which closed last week at £139 7s. 6d. for spot, £138 10s. for three months, opened at £138 15s. for spot, £138 for three months. On Tuesday it declined over £1 and on Wednesday a further £1. There was more pressure to sell early deliveries than three months, and in consequence the difference between, them was almost wiped out. On Wednesday both deliveries were quoted at the same price, and on Thursday spot was £136 5s. and three months £136. The market closes at £135 5s. for spot and three months.

Exports of tin from the Straits Settlements for the two months ending February 28th were, in tons of 2,240 lbs.:

	1898.	1899.	1900.
United States	3,282	5,325	3,613
Europe	4,435	2,925	3,385
China and India	445	28	341
Totals	8,162	8,278	7,339

The exports this year were 939 tons less than last year, and 823 tons less than in 1898.

Imports of tin into Great Britain for the three months ending March 31st were: Straits Settlements, 5,341; Australasia, 797; other countries, 1,554; total, 7,692 long tons, against 7,489 tons in 1899.

Lead.—The market is quiet and steady and there is no change in prices. We quote New York 4.65@4.70c., St. Louis 4.55@4.57½c.

Cables from London report the quotation for Spanish lead as £16 17s. 6d.@£17, English lead 2s. 6d. higher.

Imports of lead into Great Britain for the three months ending March 31st were, in long tons:

	1899.	1900.
Spain	26,799	21,592
Australasia	20,662	12,900
United States	8,397	9,066
Other countries	2,098	4,386
Totals	57,956	47,944

The decrease this year was 1,012 tons, or 17.3%.

The lead credited to the United States is chiefly Mexican lead, refined here in bond.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull and prices are unchanged, and from the looks of things, are going to be for some time to come. Missouri and chemical lead is quoted at 4.57½c., and argentiferous, 4.65c.

Spelter.—Consumers appear to be holding back and for some small lots which were pressed for sale lower prices were accepted. The stocks of metal in this country are being depleted by the heavy exports. We quote the market 4.50c. St. Louis, 4.60c. New York.

The London market is cabled as £22 7s. 6d. for good ordinaries, £22 15s. for specials.

Imports of spelter, or metallic zinc, into Great Britain for the three months ending March 31st were 17,584 long tons, against 18,820 tons last year.

Antimony.—We quote Cookson's 10½c.; Hallett's 9¾c.; U. S. Star 9½@9⅝c.

Nickel.—The price of this article continues 45@50c. according to size of order.

Platinum.—Consumption has increased and prices are higher. For ingot platinum in large quantities $18.20 per Troy oz. is quoted in New York.

Chemical ware (crucibles and dishes), best hammered metal, from store in large quantities, is worth 70½c. per gram.

Quicksilver.—The New York quotation is unchanged at $51 per flask for large lots; for small orders $52.50@$54 is asked. San Francisco quotations are $51.50 for local deliveries, and $46.50@$47 for export.

The London price has been reduced 2s. 6d., and is now £9 10s. per flask, with the same figure quoted from second hands.

Quicksilver receipts at San Francisco in March were 2,298 flasks. For the three months ending March 31st they were 6,011 flasks, which compares with 5,974 last year. Shipments by water for the three months were: To China, 1,000 flasks; Siberia, 3; Australia, 100; Central America, 450; Mexico, 1,361; Washington, 5; total, 2,919 flasks, against 3,468 last year. This statement does not include shipments overland or direct from the mines.

Imports of quicksilver into Great Britain for the three months ending March 31st were 120,388 lbs. (1,980,390 lbs., 1899). Exports were 605,756 lbs. (563,139 lbs., 1898). There was a remarkable falling off in imports this year, and the exports exceeded the imports by 485,368 lbs., reducing stocks to a low point.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as below:

Aluminum.	Per lb.		Per lb
No. 1, 99% ingots	.33@37c.	Ferro-Titanium (20%)	$1.00
No. 2, 90% ingots	31@34c.	Ferro-Tungsten (37%)	40c.
Rolled sheets	42c. up	Magnesium	$2.75@$3
Alum.-bronze	20@24c.	Manganese (over 99%)	$1.05
Nickel-alum	.33@39c.	Mangan'e Cop. (20% Mn)	32c.
Bismuth	$1.70	Mangan'e Cop. (30% Mn)	38c.
Chromium (over 99%)	1.10	Molybdenum (Best)	$1.45
Copper, red oxide	60c.	Phosphorus	40@50c.
Ferro-Molyb'um (50%)	$1.05	Tungsten (Best)	$1.00
Ferro-Titanium (10%)	90c.		

Variations in price depend chiefly on the size of the order.

LATE NEWS.

We hear, with much regret, that A. S. Hallidie, builder and inventor of the first cable-car system in the United States, which was laid down in San Francisco, died in that city April 26th, from heart disease. He was president of the California Wire Works and a regent of the University of California. He was a native of Scotland. His age was 73 years. He devised the system of wire-rope tramways known by his name, and erected them at many mines in the West. We hope to publish a fuller obituary in our next issue.

The Cuba Company filed articles of incorporation in New Jersey this week, and was fully organized at a meeting held in New York, April 26th. Sir William C. Van Horne, former president of the Canadian Pacific Railway Company, who has been the chief promoter of the scheme for developing Cuba, was elected president. William Redmond Cross was chosen treasurer and T. Sandford Beatty was chosen temporary secretary. The directors elected were Sir W. C. Van Horne, William C. Whitney, Gen. Samuel Thomas, Thomas F. Ryan, P. A. B. Widener, Edward J. Berwind, George G. Haven and Gen. Grenville M. Dodge. The Morton Trust Company was designated as the financial agent of the Cuba Company. The directors will meet again on May 9th, to discuss plans for the work to be begun, which will include considerable railroad construction in the western provinces of Cuba, and, in all probability, the unification of the present railroad system there. The company, it is expected, will also invest capital in various enterprises for the development of agricultural, timber and mining resources in Cuba.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 530.)

New York. April 27.

Heavy Chemicals.—Speculative sales of high test domestic alkali were made on dock at 85c. per 100 lbs., while makers sold over next fire at 90c. f. o. b. works. Foreign alkali is in better demand at quotations. Domestic high test caustic soda for next year sold at $1.85 f. o. b. works, while prompt deliveries are being made at $2.10@$2.15 f. o. b. works, and jobbers are selling from store at $2.25. Sal soda is more active, and monohydrate crystals are moving better. Bleaching powder continued easy. The Dow Chemical Company, at Midland, Mich., is increasing its production of bleaching powder. This is a dry white powder, made from electrolytic chlorine, manufactured from Bedford, Indiana, limestone. The company is employing a new patented process. Chlorate of potash is quiet and unchanged in price. We quote per 100 lbs., as below:

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	In New York.
Alkali. 58%.	80@85	95@$1.00	85@90
" 48%.	85@90	$1.00@$1.05	1.02½@1.05
Caustic Soda, high test....	$1.85@$1.90	2.25@2.30	$2.50@2.60
powd. 60%	.....	3.00@3.25	.....
70@74%.	.....	3.25@3.50	.....
98%.	.....	3 50@4.00	3.75@4.00
Sal Soda	70@80.	.....	67½@72½
"conc.	1.45@1.75	.....	1.60@1.65
Bicarb Soda..	1.25@1.37½	.....	1.75@2.00
" " extra	3.25@3.50	.....	.....
Bleach Pdr., Eng. prime..	.....	.....	1.87½@1.95
other br'nds.	.....	.....	1.45@1.70
Chl. Pot cryst	.. ..	9.50@9.75	10.00@10.25
" powd.	.....	9.75@10.00	10.25@10.50

Acids.—Stocks of sulphuric acid in makers' hands are small, thus delaying shipments to consumers. Blue vitriol continues in good request for export, and some large shipments to Italy are noted. No particular change in the other acids.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified:

Acetic, No.8 in lbs....	$1.62½	Nitric, 36°	$3.87½
Blue Vitriol, ...	5.12½@5.25	Nitric, 38°.....	4.12½
Aqua Fortis, 36°	3 52½	Nitric, 40°.....	4.37
Aqua Fortis, 38°	3 87½	Nitric, 42°.....	4.75d.
Aqua Fortis, 40°	4.12½	Oxalic.....	..5.85@6.00
Aqua Fortis, 42°.....	4.50	Sulphuric, 66°.....	1.20
Muriatic, 18°.	1.20	Sulphuric,160°.....	1.05
Muriatic, 20°.	1.35	" bulk 50° ton	14.00
Muriatic, 22°.....	1.50	Sulphurous, 100% SO_2anhydrous.	8.00@10.00

Brimstone.—Dull, owing to the continued heavy arrivals. This week New York imported 2,100 tons. Best unmixed seconds on spot are quoted $21@$21.50 per ton, and shipments, $20.50 @$20.75. Best thirds are worth $18.50@$19.50 per ton, as to time of delivery.

Pyrites.—Buying continues good, and prices are firm. We quote: Mineral City, Va., lump ore, $4.50 per long ton (basis 42%), and fines, $4.20. Charlemont, Mass., lump, $5.50, and fines, $5. Pilley's Island, lump, nominally $6.50, and fines, $4.50 per long ton, delivered in New York. Spanish pyrites, 13@15c. per unit, according to percentage of sulphur contents, delivered ex ship New York and other Atlantic ports. Spanish pyrites contain from 46% to 51% of sulphur; American, 42% to 44%, and Pilley's Island, N. F., 50%.

Fertilizing Chemicals.—Buyers and sellers of ammoniates are too far apart in their views to increase the volume of business, especially in blood and tankages. Sulphate of ammonia, gas liquor, of foreign make, is easier at $2.90@$2.95 per 100 lbs. for shipment, and $2.97½@$3 for spot, while domestic gas is quoted at $2.85@$2.90 f. o. b. Boston. The shipments of sulphate of ammonia from Great Britain to the United States in the quarter ending March 31st, as compiled by us as below, comparison being made with last year, in long tons:

	1899	1900	Changes.
January	1,274	284	D. 990
February..	480	714	I. 234
March	760	389	D. 371
Totals.....	2,514	1,387	D. 1,127

Much the greater part of these shipments were made to Atlantic coast ports, though some were to San Francisco direct.

High grade Western blood is quoted at $2.10 per unit, f. o. b. Chicago; tankage, $2 and 10 f. o. b. Chicago; concentrated tankage, $1.95@ $1.97½ per unit, f. o. b. Chicago; Calcutta bone meal, $25.50@$23.50 per ton; domestic steam ground bone, $21@$22 per ton; regular bone, black, $20@$21, and spent, $15@$16. The consumption of fertilizers in Tennessee from the autumn of 1899 to January 1st, 1900, amounted to 30,365 tons. The fertilizer shipments from Charleston, S. C., in the season of September to March 31st, 1900, amounted to 229,315 tons, against 183,521 tons in 1898-99, showing an increase of 45,794 tons. The imports of potash salts into the United States in 1899 were distributed as follows, the figures in parenthesis being for 1898: Muriate, 48,631 long tons (51,758 in 1898); sulphate, 8,697 (8,898); manure salt, 20,519 tons (not given); double manure salts, 5,430 tons (8,503); kainit, 124,022 tons (144,015); sylvinit, 10,931 tons (27,953 tons in 1898). The total imports in 1899 were 218,230 tons, against 241,127 tons in 1898, showing a decrease of 22,897 tons, or 9%.

The prices for potash salts, at New York, Boston and Philadelphia, per 100 lbs., are as follows: Muriate of potash, 80@85%, basis 80%, $1.83; muriate of potash, minimum 95%, basis 80%, $1.86; sulphate of potash, minimum, 90%, basis 90%, $2.05½; sulphate of potash, minimum 96%, basis 90%, $2.08½; manure salt, minimum 20% potash, 64@66c.; double manure salt, 48@ 53%, basis 48%, $1.06; Kainit, 12.4% potash, $9.05 @$9.30 per long ton; and sylvinit, 38½@39½c. per unit. For Norfolk prices add 2c. per 100 lbs. to the concentrated salts, except double manure salts, to which add 1c., and for kainit add 30c. per ton, and sylvinit 1c. per unit. For Charleston, Savannah, Wilmington, N. C., and New Orleans add 1½c. per 100 lbs. to the concentrated salts, except 20% manure salt, to which add 1c.; and to kainit add 20c. per ton, and sylvinit, 1c. per unit. These prices are for not less than 500 tons of bulk salts or 50 tons of concentrated salts, and are based upon river shipments from the mines to seaport. For shipments by rail add 5c. per 100 lbs.

Nitrate of Soda.—The steamer "Charles Racine" arrived from Hampton Roads. We also note the arrival of the steamer "Helen Brewer" with 18,420 bags, and the "Themis" with 1,867 bags. The arrivals at this port so far in April amount to 82,375 bags. Spot has sold at $1.95 per 100 lbs., while shipments are quoted at $1.75 and upward, according to position.

Phosphates.—In Tennessee, especially in Maury County, sales of phosphate land lately have been large, and at high prices. Swift & Company, the Chicago packers, are running their mines near Spring Hill, Tenn., on full time, and are shipping from their stock piles 3 car loads daily to their fertilizer plant at Atlanta, Ga. In the quarter ending March 31st shipments from Mt. Pleasant, Tenn., aggregated 110,171 tons. The Hickman County mines sent forward in March 2,680 tons, against 1,365 tons in the same month last year. In Florida the rock shipments in April will likely exceed those for March, and in the pebble district miners' views as to prices are firmer. South Carolina miners are understood to be working on full time generally, while the demand for rock is moderate and prices hold steady. The shipments of phosphates from the Tebessa region, in Algeria, in January amounted to 15,360 tons, against 20,970 in December, and 18,470 tons in January, 1899.

Exports of American phosphates are slower, as superphosphate manufacturers in Europe anticipate lower prices.

Ocean freight rates from Florida ports are about as follows: To Baltic ports, $5.04@$5.16 per ton; Continental, $4.76@$4.88, and Mediterranean ports, $4.89@$5.01, while from Savannah, Ga., to the United Kingdom, $4.25@$4.50 is asked. We quote as follows:

Phosphates.	Per Ton F. o. b.	C. i. f. Un'd Kingdom or No Sea Ports.	
		Unit.	Long ton.
*Fla. hard rock (77@80%)	$8.00@8 50	8¼@8¾d	$12.87@13.06
*Fla. land pebble (68@73%)	4 35	7d	9.80
*Fla. Peace River (58@63%)	3.00@3 50	6¾@7d	8.10 @ 8.40
†Tenn. rock.....(78@80%)	3.25@3 75	7@7½d.	10.06@11.25
†Tenn. rock.....(70@75%	2.25@3 00	.....	.....
‡So. Car. rock, undried.	3 75@4.00	.....	.....
‡So. Car. rock, dried....	4 50@4.75	.....	.....
‡So. Car. rock, ground .	6.00	.....	.....
Algerian, rock...(63@70%	.....	7d	9 30
Algerian, rock....(58@63%)	.....	6¾d	8.18

*Fernandina. †Mt Pleasant. ‡Fetteressa.

Concentrated phosphates, 13@15%, average P_2O_5, 6½c. per unit ($9 per ton). Tennessee acid phosphates, high grade, $12 per short ton, and low grade, $10 f. o. b. Nashville.

MINING STOCKS.

Complete quotations will be found on pages 517 and 518 of mining stocks listed and dealt in at:

Boston, Colo. Springs, Denver, New York, Philadelphia, Spokane, Salt Lake, San Francisco, Toronto, Montreal, London, Mexico, Paris.

New York. April 27.

Amalgamated stock dropped from $93⅞ to $91, and Anaconda from $49 to $44½. British Columbia Copper sold at $11¾@$12, and Union at $5¾ @$7.

Arizona Copper Smelting made a sale at $10½, and Arizona Lead is reported sold at $15½. American Smelting and Refining common was weaker at $38½@$36⅛, while the preferred brought $90@$88¾. The $1,000,000 first mortgage bonds of the Consolidated Kansas City Smelting and Refining Company, which mature on May 1st, will be redeemed on that date out of the earnings of the American Smelting and Refining Company. Thus only $1,133,000 in bonds of constituent companies will remain to be paid.

In the California section Standard Consolidated was strong, selling at $3.95, and quoted up to $4, a gain of 50c. since last week. Brunswick recovered, selling up to 33c., but later receded to 30c. Plymouth brought 15c.

The Colorado stocks were in steady demand. Elkton Consolidated brought $1.25 on a report that the new company would declare a 3c. quarterly dividend in June. Tornado was sympathetic, selling at 48c. Isabella held at $1.25. Jack Pot gained 4c. at 65c. Work was influenced by the report that a new find was made on the Morning Glory lease; the stock rose 3c. to 36c. Pharmacist held at 14c., Alamo at 16½c., Argentum Juniata at 22c., Garfield at 19c., Cripple Creek Consolidated at 14½c., Iron Silver at 69c., Lacrosse at 15c., Small Hopes at $1.05, Leadville at 7c., and Little Chief at 19c.

Horn Silver of Utah made a sale at $1.20.

Of the Comstock shares sales were reported of Consolidated California & Virginia at $1.70@ $1.65; Ophir at 60c., Sierra Nevada at 50c., and Best & Belcher at 24c.

The Cambria Steel Company has declared a quarterly dividend of 50c. per share, payable May 15th, and an extra of $4.50 per share, payable May 1st, to enable stockholders to pay the $4.50 assessment on May 1st. The contemplated call for the payment of an instalment of $1.50 per share on June 1st will be unnecessary.

The Nutmeg Zinc Mines Company, claiming to own property in Marion County, Ark., and capitalized at $200,000, is offering its stock at 40c. per share. This outfit is practically the same that promoted the Congdon Zinc Mines Company of Arkansas.

Boston. April 26.

(From Our Special Correspondent.)

The market this week has been dull and narrow, and no event worth recording disturbed its quiet. Yesterday, up to 2 p. m., less than 2,500 shares of mining stocks were sold, and this gives a fair idea of conditions. Prices were in accordance with the state of the market.

Calumet & Hecla sold to-day at $747; Boston & Montana, $307; Quincy, $139; Osceola, $67; Wolverine, $40½; Atlantic, $25; Parrot, $44; Utah, $30.

Outside the coppers there was little doing. Centennial Eureka sold at $23½, while Cochiti was quoted at $11, with no sales. United States Oil brought $18.

The outside list was more active and Dominion Coal common sold up to $45.

The boom has apparently taken an early vasation and we must wait until fall. A few hopeful souls still look for a general rise soon, but most people have given it up. The flurry in the industrials and the fear of more Chicago "smart" operations have finished up the little life which the Globe Bank failure and blind pool tactics had left.

A company that proposes to mine graphite in Worcester County is being floated here. This is the Massachusetts Graphite Company, with $100,000 capital stock in $10 shares, which proposes to work the old Black Lead Mine 5 miles from Sturbridge. The mine was opened as far back as 1643 and was worked quite extensively in colonial times, but has lain idle many years. The officers of the new company are: E. S. Hill, Boston, president, and E. S. Hill, M. P. Clarke, D. R. Smith, H. C. Fiske and Roland Litchfield, directors; M. A. Sears, superintendent.

Colorado Springs. April 23.

(From Our Special Correspondent.)

The market on the Board of Brokers' Exchange and the Colorado Springs Mining Stock Association showed a somewhat better condition the past week than for some time. Buyers are still tentative and not at all inclined to give what the stocks are held at, but the sellers are equally firm, and this, of course, tends to keep the trading down. There has been a general improvement, however, in every department of mining stocks the past few days, but this has not resulted in any increase in the volume of business, but rather in stiffening prices. The smelter-mineowner controversy is past the critical stage, the former having yielded. The announcement some three weeks ago that the Mine-Owners' Union had agreed to cut off all production affected the list seriously; but now all trouble is apparently over and the Portland, Vindicator, Isabella and a score of lesser lights are recovering their former strength.

The Mine-Owners' Union of Colorado Springs has broken the backbone of the Smelter Trust in quick order. The plants at Pueblo made the first advances to the mineowners and the Trust followed suit without delay.

Salt Lake City. April 21.

From Our Special Correspondent.)

Monday being Arbor Day—a legal holiday in Utah—this was a short week for trading in mining shares, as well as a quiet and uneventful one. Altogether the sales as reported aggregate 95,568 shares, which sold for $35,312. There were no specially noteworthy hops, though a few alert professionals tried to vary the monotony by whooping matters up in spots, with

spasmodic success. Prices have held fairly steady, with no particularly discouraging slumps.

The chief activity was in Mammoth, which wears earmarks of manipulation by those purposing to buy the Cunningham holdings.

There is a move to list several of the Utah dividend-payers in Boston—Daly-West and Silver King being the first to be selected, with Mercur-De La Mar another favorite, should the pending consolidation be consummated. Hornblower & Weeks are behind this project. Time is showing that this firm made a hit with Bingham Copper and Gold, which, from a flattering prospect, has proven a mine of moment, and the belief prevails that the pyritic smelter under construction will be the desideratum in this field that the Bimetallic is in Leadville, or even more so. At present the Utahs traded in directly at Boston are Bingham Copper and Gold, Centennial-Eureka, United States and Utah Consolidated. Lower Mammoth is still expectant.

Mammoth has well held up. A sale this evening is reported at $2.35, with keen demand. May Day continues active, with transfers during the week from $1.05 to $1.15. Mercur is stronger in the bid. Opinion gains ground that the consolidation with the De La Mar's mines is to take place.

San Francisco. April 21.

(From Our Special Correspondent.)

The market continues quiet, with prices a little firmer, but no addition to the volume of trading. We have reports of progress from the electric power people on the Comstock, but they excite very little interest.

Consolidated California & Virginia sold at $1.70 @$1.75; Caledonia, $1.65; Yellow Jacket, 33c.; Overman, 25@27c. No business reported outside the Comstocks.

On the Oil Exchange business has been good. Some quotations noted are: Home Oil, $3.95¼@$4; San Joaquin, $2@$2.10; Barker Ranch, $1.15; Caribou, 50c.

The following new oil companies have been organized recently, the places given being the location of the offices: San Francisco, Barkersfield Crude Oil Company, $500,000; Oakland, Pacific Mutual, $10,000; Stockton, Miocene, $75,000; Bakersfield, Section Four, $100,000; Central Point, $100,000; Coalinga, Advance, $250,000; Pasadena, New England, $200,000; Los Angeles, Acme, $200,000; Alpha, $100,000; Consolidated, $1,000,000; Manhattan, $300,000; Pacific Slope, $500,000; Pearl, $300,000; Queen, $250,000.

The California Debris Commission will give a hearing on April 30th to newly received applications to mine by the dydraulic process from the Red Dog Mining Company and South Yuba Water Company, in the Red Dog Mine, near You Bet, Nevada County, to deposit tailings in Greenhorn Creek; from Martin Klein, in the Bowlder Hill Mine, near Placerville, El Dorado County, to deposit tailings in a ravine below the mine; from G. E. Volmer, in the Little Klondike placer mine, near Placerville, El Dorado County, to deposit tailings in Coon Hollow Creek; and from E. W. Hayden, in the Bluff placer mine, near Mountain Ranch, Calaveras County, to deposit tailings in a ravine below the mine.

The general offices of the Ratcliff Consolidated Gold Mines, Limited, whose mines are near Ballarat, have been removed to 405 to 408 Douglass Building, Los Angeles, Cal. This move was made to lessen the distance of communication between the general offices and the mines. Mr. O. O. Howard, Jr., chairman of the company, reports that developments at the mine are exceedingly promising, and that the plans for increasing the plant are being carried out with dispatch.

The Ruby Hill Tunnel and Mining Company of Eureka, Nev., has elected the following directors for the ensuing year: P. H. Hjul, M. Bartlett, James Wilson, A. Laird, P. Paroni. The trustees elected the following officers: P. H. Hjul, president; M. B. Bartlett, vice-president; B. F. McEwen, secretary and treasurer.

London. April 10.

(From Our Special Correspondent.)

The mining market has been very quiet this week and the copper section is the only one that has shown any life at all. South Africans have been stagnant as usual, and, if anything, have inclined to relapse, owing to Lord Roberts' continued inaction and the various reverses suffered by the British forces. The mining market is gradually beginning to lose faith in the War Office and the people responsible for the conduct of the war and the feeling among shareholders is temporarily pessimistic. Of course, everyone still believes that British arms must win in the long run, but the sudden termination of the triumphant march through the Free State and the smartness of the Dutch in laying down their arms and then rising again, have entirely checked any inclination to speculate in South Africans.

The West Australian section has been quite dead and prices have generally receded, owing to the continued mystery regarding the treatment of the sulphides and lower grade ores. Everyone is hoping that some definite report will be issued soon.

As mentioned already, the market in shares of copper companies has been extremely brisk this week. Rio Tintos £5 ordinary shares have gone up to £60, and most of the other companies are equally well supported. The idea has now become prevalent that the present high price of copper may be maintained indefinitely in spite of the warnings of many people in a position to judge. It is agreed that the high price has nothing to do with the Amalgamated ring, but to the increase in consumption and the difficulty in finding new producers.

I have mentioned in my last two letters that the collapse of the Panuco Copper Company has created considerable excitement in London. This has been increased still further this week by the action taken in Chancery by some of the shareholders for the compulsory winding up of the company. The directors had already announced that they intended to recommend voluntary liquidation and had convened a meeting of shareholders to discuss the situation. In the meantime the application at law had been taken and the judge gave his unqualified assent to a compulsory liquidation. Instead of the liquidation taking place under the control of the directors, it will therefore take place under the official receiver, and if the latter is half sharp enough, he will discover some things which will be very edifying to the shareholders. A voluntary liquidation is a capital way of hiding up failures and hushing up the doings of directors in their several capacities as promoters, shareholders and directors. Of course it will be impossible to show in the present case that any legal irregularities have been committed, but it will be shown—as it has been shown over and over again—that the flotation of a public company is intended for the special benefit of the vendor and his friends and that it is by no means an altruistic performance. It is rather a remarkable thing that everyone exonerates the directors from blame in connection with the transactions, and, if anything, the directors are praised for deciding on liquidation. It seems to be forgotten, however, that the directors were responsible for the promotion and that the nominal vendor was one of their own circle. Also, it should be known that the directors have been selling their shares continuously, even though they were aware that there were grave doubts as to the value of the property. We have also been treated to a letter from the original owner of the property, Mr. Hugh McDonnell, who still persists in his opinion that the property is a magnificent one. He says with great eloquence that if his statements are proved untrue he will forfeit all the shares he holds; though, of course, if the property is worthless his sacrifice will amount to nothing.

Paris. April 15.

(From Our Special Correspondent.)

The market for the Transvaal gold shares continues very uncertain. The main question now relates to the action of the Boers with respect to the mines. It is hardly believed here that they will inflict any serious damange on the property of the companies; still, there are some who look for general destruction.

Copper continues to hold its own, and I think that those who have talked so much of the American combination and of restricting production are beginning to see that the real factors in the case are the great demand and consumption of the metal. The fact is that most European buyers have held off in the hope that prices would decline until they are almost bare of stocks and must secure the metal. Our London friends have upheld the delusion even more than we. Thus London has been a persistent speculator for the fall in Rio Tintos, while Berlin and—to some extent—Paris also have operated for the rise. The result is that London has lost heavily, while Rio Tintos have gone up.

Le Nickel shares have actually risen to 525 fr. It is announced that the dividend for 1899 will be 17.50 fr. a share. This was approved by the stockholders at their annual meeting last week.

Huanchaca Silver is a stock which is coming into favor once more. It continues to rise, and sold this week at 166 fr.

The provisional figures for the coal production of France in 1899, compared with the definite figures for 1898, are as follows, in metric tons:

	1898.	1899.
Coal	31,826,127	32,331,053
Lignite	529,977	602,735
Totals	32,356,104	32,933,788

The increase in coal was only 504,926 tons, or 1.6%, while that in lignite was 72,758 tons, or 13.7%; the total gain being 577,684 tons, or 1.8%, last year.

The Swiss National Council had last week under discussion a resolution by M. Joos in favor of a revision of the monetary system by the adoption of a gold standard. The Federal Council opposed the motion, declaring that the withdrawal of Switzerland from the Latin Monetary Union would cause great inconvenience at the present moment. The resolution was rejected, only 6 votes being given in support of it.

The Chamber of Deputies has voted, without discussion, a measure which has been before it for the last 10 years—that to reduce the legal rate of interest from 6 to 5% in commercial matters, and from 5 to 4% in civil affairs. A bill with that object was presented in 1893, but failed the General Elections. In 1898 a bill was passed, but was sent back to the Chamber by the Senate, with modifications. It has now been finally adopted. The measure does not restrict the liberty of contracting parties, but is only applicable when no rate of interest has been or could be stipulated, as in judicial sales, accounts of trustees, successions, damages awarded in civil or commercial actions, etc. The old legal rates of interest were fixed by the law of 1807.

The great Exposition is formally opened. Matters are very backward, however, and it will be a month yet before it is fully in shape for visitors.

Azote.

DIVIDENDS.

NAME OF COMPANY.	Latest Dividend. Date	Per share.	Total.	Total to date.
†Ala. Con. C. & I., pf.	May 1	$1.75	$43,750	$87,500
†Alaska Mexican	Apr. 28	.10	18,000	465,631
†Alaska Treadwell	Apr. 2	.37½	75,000	4,370,000
†Amalgam'ted Copper	Apr. 30	2.00	1,500,000	4,500,000
§Am. Steel Cast'g, com	May 8	3.00	.....	.....
Anaconda Copper	Apr. 30	2.00	2,400,000	11,550,000
Bethlehem Steel	June 1	.50	150,000	.....
§Boston & Colo. Sm.	Apr 25	.30	4,500	297,000
Boston & Montana	May 29	10.00	1,500,000	17,200,000
*Buffalo Hump	May 1	.10	25,000	100,000
†Cambria Steel	May 15	.50	160,000	.....
*Commonwealth Zn.	May 1	.05	5,000	40,000
Home, Colo.	May 1	1.00	50,000	50,000
Flat Top C. L. Asn. com	May 1	.50	18,570	.....
" " " pf	May 1	1.00	37,141	.....
†Internat'l Pump, pf.	May 1	1.50	132,750	.....
*International Zinc	May 1	.01	6,000	21,000
†National Carbon, pf.	May 15	1.75	78,750	236,250
†National Salt, pf.	May 1	1.75	42,000	.....
" " com	Aug. 1	1.50	52,500	.....
†Phœnix Iron, pf.	Apr. 30	1.75	.....	.....
†Pittsburg Coal, pf.	Apr. 25	1.75	539,000	.....
†Pressed Steel Car, pf.	May 28	1.50	187,500	.....
" " com.	May 21	1.50	187,500	.....
†Warwick I. & St., pf.	May 10	2.00	.....	.....
" extra	May 10	.50	.....	.....

* Monthly. † Quarterly. § Extra.

ANNUAL MEETINGS.

Name of Co.	Locat'n.	Date.	Place of Meeting.
Alamo	Utah	May 21.	Salt Lake City, Utah
Alaska	Utah	May 4.	Salt Lake City, Utah.
Anaconda	Mont.	May 19.	Anaconda, Mont.
Anchoria Leland	Colo	May 15.	Colo. Springs, Colo.
Boston&Colo.Sm	Colo	May 10.	Argo, Colo.
Constellation	Utah	May 7.	Park City, Utah.
Crown Point	Nev	June 7.	San Francisco, Cal.
Church	Cal.	May 7.	San Francisco, Cal.
Dahlonega Con.	Ga	May 2.	Toledo, O.
Golden Star	Utah	May 24.	Salt Lake City.
Goleta	Cal.	May 19	San Francisco, Cal.
Tievarkee	Utah.	May 8.	Salt Lake City, Utah.
Homestake	Utah.	May 7.	Salt Lake City, Utah.
Iron Silver	Colo	May 1.	30 Broad St., N. Y.
Justice	Nev.	May 7.	San Francisco, Cal.
Nugget	Colo	May 5.	Colo. prings, Colo.
Penn. Coal	Penn.	May 16.	Dunmore, Pa.
Playa de Oro	Ecuado'	May 1.	Versailles, Ky.
Tamarack	Mich.	May 3.	Boston, Mass.
Tasmania Cop'er	Colo	Apr. 30.	Cheyenne, Wyo.
Union Copper	N. Car.	May 10.	East Orange, N.J.
Va. Iron, Coal & Coke	Va	May 15	Pulaski, Va.
Velardena M.&S	Colo	May 7.	Denver, Colo.
Wyandot	Mich.	May 14.	Boston, Mass.

*Special meeting.

ASSESSMENTS.

NAME OF COMPANY.	Location.	No	Delinq.	Sale.	Amt.
Acorn	Utah	2	Apr 21	May 12	.03½
Alaska	Utah	..	Apr. 25	May 14	.02
Badger	Ore.	1	Apr. 2	May 2	.10
Best & Belcher	Nev.	70	May 11	May 31	.15
Bunker Hill	Utah	4	Apr. 27	May 15	.00½
Chollar	Nev.	51	Apr. 25	May 16	.15
Con., Cal. and Va.	Nev.	15	Apr. 10	May 1	.20
Confidence	Nev.	34	Apr. 18	May 9	.20
Eureka Con. Drift	Cal.	...	May 8	...	.00½
Eureka Swansea Ext.	Utah	1	Apr. 16	May 15	.00½
Kutonia	Utah	1	May 4	May 24	01
Excelsior Drift	Cal.	...	Apr. 30	.....	.03
Ely	Utah	6	May 3	.....	.03
Four Aces	Utah	4	Apr. 26	May 16	.02
Goleta Con	Cal.	1	Apr. 30	May 28	.06
Gould & Curry	Nev.	89	Apr. 10	May 2	.15
Grape Vine Canyon	Cal.	2	May 8	May 29	.07
Hale & Norcross	Nev.	4	Apr. 9	Apr. 30	.10
Hilda Gravel	Cal.	...	May 7	.....	.01
Independent	Nome	1	May 3	May 21	.10
Joe Bowers Ext.	Utah	7	May 21	June 8	.10
Lucky Bill	Utah	...	Apr. 30	May 21	.02
Marina Marsicano	Cal.	23	May 7	May 28	.62
Mariposa Con'l	Cal.	16	May 10	June 5	10.00
Maxfield	Utah	7	Apr. 30	May 28	.09
Mayflower	Utah	...	May 1	May 29	.00½
Meteor	Utah	...	Apr. 14	May 17	.00½
Mexican	Nev.	63	Apr. 11	May 2	.15
National Con	Cal.	11	May 1	.....	.05
North Rapidan	Nev.	..	Apr. 24	.....	04
Osceola Con	Cal.	9	Apr. 28	May 21	.01
Potosi	Nev.	55	Apr. 18	May 9	.15
Reward	Cal	...	May 12	.....	.02
Sailor Con	Cal.	3	Apr. 14	May 5	.01
Savage	Nev.	100	May 8	May 28	.10
Silver Park	Utah	2	May 7	May 26	.02
Skagit Cumb'la'd Coal	Was.	7	Apr. 17	May 15	.01½
Snow Flake	Utah	...	Mar. 1	Mar. 31	.05
South Paloma	Cal	2	Apr. 23	May 14	.006
Sunbeam Con.	Utah	25	Apr. 17	May 4	.10
Tetro	Utah	12	Apr. 28	May 19	01
Union Con.	Nev.	59	Apr. 10	Apr. 30	.15
Yellow Jacket	Nev.	3	Apr. 10	May 15	.15

STOCK QUOTATIONS.

NEW YORK.

Name of Company	Location.	Par val.	Apr. 20. H.	Apr. 20. L.	Apr. 21. H.	Apr. 21. L.	Apr. 23. H.	Apr. 23. L.	Apr. 24. H.	Apr. 24. L.	Apr. 25. H.	Apr. 25. L.	Apr. 26 H.	Apr. 26 L.	Sales
Alamo	Colo..	1	.16	....	.16	....	.16½	....	....	....	.16½	....	....	....	2,500
Alice, g. s.	Mont.	25	....	....	.50	....	.50	....	....	....	.50	....	....	....	....
Amalgamated C	"	100	92.25	92.75	93 88	93.25	91 75	91.25	91 38	92.00	92.25	91.63	92.50	92.00	1,500
*Anaconda, c	"	25	47 00	45.40	49.00	47.00	45 50	44.13	46 50	45 63	47.00	45.50	45.50	....	8,395
Anaconda Gold	Colo..	5	....	....	.35	....	.35	....	....	....	.35	....	....	....	....
Arcentum-Jun..	"	2	....	....	.25	....	.19	....	....	....	....	....	....	....	1,500
Ariz Top	Ariz.	....	....	....	19.50	....	....	....	....	....	....	....	....	....	20
Ariz. Lead	"	25	14.50	14.00	14 50	14.00	14.50	14 00	14 75	14 25	15 25	14 88	16.00	15 75	....
Brit.Col.Copper	B. C..	1	12.00	11.50	12 00	11 50	12.00	11.25	12.00	11.50	14 00	11 50	12.0	11.38	300
Brunswick	Cal..	....	....	....	.85	.82	.83	.80	.80	....	.80	....	....	....	1,800
Chollar	Nev.	50	....	....	.25	....	.26	....	....	....	.18	....	....	....	....
Chrysolite	Colo..	100	....	....	....	....	.06	....	....	....	.06	....	....	....	....
Comstock T	Nev.	2½	....	....	.04	.03½	.03½	....	.03½	....	.03	....	....	....	3,000
Con. Cal. & Va.	"	10	1 70	....	1.70	....	1.65	....	....	....	1.45	....	....	....	350
Cr & Cr. Creek	Colo..	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Cripple Cr. Con.	"	3	....	....	....	....	.14	....	.14½	....	....	....	....	....	1,300
Cr wn Point	Nev	25	....	....	....	....	....	....	....	....	....	....	....	....	....
Daly	Utah.	10	1.50	....	1.50	....	....	....	....	....	....	....	....	....	100
Deadw'd Terra.	S.Dak	1	....	....	....	....	.60	....	....	....	.60	....	....	....	....
Elkton	Colo	100	....	....	....	....	....	....	1 25	....	....	....	....	....	100
Father de Smet.	S Dak.	1	....	....	.07	....	.07	....	....	....	.07	....	....	....	....
Garfield Con	Colo..	1	....	....	....	....	....	....	....	....	.19	....	....	....	500
Golden Age	"	1	....	....	....	....	....	....	.04	....	....	....	....	....	1,000
Golden Fleece	"	100	....	....	.24	....	.32	....	....	....	.32	....	....	....	....
Homestake	S. Dak	25	....	....	....	....	50.00	....	....	....	50.00	....	....	....	....
Horn Silver	Utah..	20	1 25	....	1.20	....	1.20	....	1.20	....	1.15	....	....	....	300
Iron Silver	Colo.	1	....	....	.69	....	.68	....	....	....	.68	....	....	....	100
Isabella	"	1	1 25	....	1.15	....	1.20	....	1.23	....	....	....	....	....	400
Jack Pot	"	10	....	....	....	....	....	....	.63	....	.65	....	....	....	600
Lacrosse	"	1	....	....	....	....	.15	....	....	....	....	....	....	....	800
Lady Helen	Colo..	1	83 00	81 00	83.00	81.00	83 00	81 00	83 00	81 60	85.00	83 00	....	....	100
Little Chief	"	1	....	....	.19	....	.18	....	....	....	.9	....	....	....	....
Mexican	Nev..	3	....	....	.3	....	.30	....	....	....	.26	....	....	....	800
Mollie Gibson	Colo .	5	.25	....	.25	....	.24	....	....	....	....	....	....	....	....
Mt. Rosa	Colo..	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario	Utah.	100	....	....	8.25	....	8.00	....	....	....	8 25	....	....	....	100
Ophir	Colo	1	....	....	.68	....	.60	....	....	....	.54	....	....	....	1,500
Pharmacist	"	1	....	....	....	....	....	....	.14	....	.14	....	....	....	....
Phœnix	Aris..	1	....	....	.10	....	.09	....	....	....	.10	....	....	....	100
Plymouth	Colo..	1	....	....	1	....	.12	....	....	....	.12	....	....	....	....
Portland	"	1	....	....	2 4	....	2 4	....	....	....	2 45	....	....	....	185
Potosi	Nev..	1	....	....	.25	....	.22	....	....	....	.22	....	....	....	....
Quicksilver	Cal..	10	....	....	1.50	....	1.50	....	....	....	1.50	....	....	....	68
do. pref	"	10	....	....	7.50	....	7.50	....	....	....	7.5	....	....	....	805
Savage	Nev..	2	....	....	.08	....	.08	....	....	....	.05	....	....	....	25
Sierra Nevada	"	3	....	....	.43	....	.50	....	....	....	.46	....	....	....	330
Small Hopes	Colo	20	....	....	1.05	....	1.05	....	....	....	.90	....	....	....	25
Specimen	Colo.	1	....	....	....	....	....	....	....	....	....	....	....	....	1,985
Standard Con	Cal.	10	....	....	3.70	....	3 70	....	....	....	4 00	3 90	....	....	69
Tenn Copper	Tenn	10	16.00	14.75	16.00	14.75	16.00	14.75	16 00	14.75	15.00	13.50	14 50	13.50	35
Tornado	Colo..	1	....	....	.15	....	....	....	....	....	....	....	....	....	460
Union Con	Nev	2½	....	....	.28	....	.28	....	....	....	.20	....	....	....	5
Utah	Utah.	10	....	....	....	....	....	....	....	....	....	....	....	....	28
Work	Colo	1	....	....	....	....	.3	....	.36	....	.34	....	....	....	5
Yellow Jacket	Nev	2	....	....	.28	....	2	....	....	....	....	....	....	....	1,300

COAL AND INDUSTRIAL STOCKS.

Am. Sm. & Ref.	.....	$100	38⅝	37⅝	38⅝	37⅝	38⅝	36⅝	38⅝	38⅛	38⅝	38	38⅝	....	4,642
" " " " pf	.....	100	90	89⅞	90	....	89¼	88⅜	89	....	89⅜	....	89	....	2,972
Am.S & W Con	.....	100	47⅜	4 ¼	4 ⅜	37⅜	41⅜	37⅜	41⅜	40¼	41⅝	40⅜	41¾	....	186794
" pf'r n	.....	100	80½	77⅜	7	76	78¾	76¾	80	78½	80	79½	79¾	....	58,594
Am. Tin Plate	.....	100	31⅜	29	28½	....	28	25	27¾	27	28	27¾	28	....	5,7 0
" " " pf	.....	100	78⅜	78	79	....	....	....	78½	....	....	....	79¾	....	1,715
Col. Fuel & I	Colo..	100	44½	43¾	41¾	41	41⅝	39½	42	40¾	42⅜	41½	44	....	15,465
Col. & H.C.& I.	"	100	18	17⅜	17⅜	17¼	17⅜	17⅜	....	....	17⅜	....	....	....	1,3 0
Federal Steel	.....	100	45	43¾	42⅜	39	4 ¾	39½	42¼	41	43¾	41⅝	43	....	8,.10
" " pf	.....	100	71⅜	71	71	69	69½	68	70⅜	69⅜	70⅜	70¼	71¾	....	10,160
Fleming'n C.&C	W.Va.	100	24	21	26	24	28	24	28	24	30	23	30	23	....
Int'l Pump	.....	....	21	20	21	20	20	19	20	19	20	19	21	20	....
National Lead	N. Y.	100	38	38	23	22¾	22¾	22	2 ¾	....	23	22¾	....	....	1,355
" " pf	.....	100	105	101¾	....	....	104¾	....	....	....	105	104¾	....	....	670
National Salt	.....	100	43¾	47⅜	49¾	43	46¾	46	47⅜	46	47	46	47⅜	46	200
" pf	.....	100	79	77	79	77	79	77	79	77	77	75¼	7 ¾	76½	....
Nat'l Tube	.....	100	50¾	49	5 ¼	49	49¾	48¾	49¾	49¾	51	50	51¾	....	11,884
Press. St. Car	Pa ...	100	49¼	49	..	....	49¾	50	48	47¾	48¾	....	46¾	....	1,935
" " " pf	"	100	82	....	....	....	8 ⅜	79	8 ¾	....	83	....	....	....	580
Republic I. & S.	.....	100	19¼	19⅛	19	18	18	17⅝	18⅝	18	9	18⅜	18⅛	....	5,265
" " pf	.....	100	62⅜	62⅛	61	59	60	59	6 ⅜	....	61	60	....	....	3,122
Sloss-Shef.	.....	100	28	....	28	....	28	....	27	25	26	24	26	24	....
" " pf	Ala...	100	67	365¾	67	63¾	67	63¾	67	65	67	65¾	67	65	....
Stan.Oil of N J	"	100	544	541	544	541	545	540	544	540	544	540	542	537	....
Tenn.C.,I.&R.R.	"	100	*88¾	85	85	83¼	84	81¼	84¼	83¾	85	83½	85	....	14,370
" " " pf	"	100	....	....	....	....	....	....	....	....	....	....	....	....	....
U.S.Cast I.P&F	.....	100	6¾	5¾	6	5¾	6	5¾	6½	5¾	6¾	5¾	6	5¾	....
" pf	.....	100	46¾	45	46	44¾	46	*44¾	46	45	46	45	46	45	....
Va.Coal & C	W.Va.	100	22	19	23	19	22	19	22	19	22	19	....	....	....

* Ex-dividend. Total sales, 435,416.

PHILADELPHIA, PA.*

Name of Company.	L'cation.	Par Val.	Apr. 19. H.	Apr. 19. L.	Apr. 20. H.	Apr. 20. L.	Apr. 21. H.	Apr. 21. L.	Apr. 23. H.	Apr. 23. L.	Apr 24 H.	Apr 24 L.	Apr. 25. H.	Apr. 25. L.	Sales
Am. Alkali	.....	.....	2.38	2 25	....	....	2.50	....	2 2	....	2.50	2 38	....	....	427
" " pf.	.....	.....	....	....	....	....	.63	....	....	....	.65	.5	....	....	450
Bethlehem Irn	Pa.	.....	....	....	57.85	57.50	57.25	....	....	....	....	....	....	....	3
Bethlehem S'l	"	$50	....	....	17.88	....	....	....	17.25	....	17.00	....	....	....	141
Cambria Iron	"	50	44.50	....	44 5	....	44 50	....	....	....	44.50	....	44 50	....	365
Cambria Steel	"	50	23.25	21.00	21.75	21.38	21.50	21 00	21.00	20.63	20.88	20.63	20 88	20.63	10,215
Susq. I. & S.	"	10	....	....	....	....	3.88	....	....	....	3.75	....	....	....	55
United Gas I.	"	50	118	117¾	118	117¾	118	117¾	118	117¾	117	117	116¼	115¾	837

Total shares sold, 13,006. * Reported by Townsend, Wheien & Co., 309 Walnut St, Philadelphia

SAN FRANCISCO, CAL.

Name of Company.	Location.	Par value.	Apr. 19	Apr. 20.	Apr. 21.	Apr. 23.	Apr. 24.	Apr. 25
Belcher	Nev.	$3 00	.21	.21	.19	.17	.16	.16
Best & Belcher	"	3 00	.24	.23	.21	.20	.20	.19
Caledonia	"	3.00	1 35	1 25	1.20	1 20	1.25	1.30
Challenge Con	"	3.00	.20	.20	.19	.18	.16	.16
Chollar	"	3.00	.12	.10	.4	.23	.22	.22
Confidence	"	3.00	.95	.90	.80	.80	.81	.81
Con. California & Virginia	"	2 50	1 65	1.65	1.60	1 55	1.55	1.50
Crown Point	"	3.00	.18	.17	.14	.14	.12	.13
Gould & Curry	"	3.00	.27	.25	.24	.22	.22	.22
Hale & Norcross	"	3.00	.36	.36	.33	.34	.32	.32
Justice	"	2.00	.04	.04	.03	.03	.02	.02
Mexican	"	3.00	.33	.32	.31	.29	.29	.28
Occidental Con	"	3.00	.11	.1	.14	.11	.10	.08
Ophir	"	3.00	.71	.65	.61	.58	.59	.57
Potosi	"	3.00	.27	.27	.20	.26	.20	.21
Savage	"	2.50	.10	.10	.09	.09	.08	.07
Sierra Nevada	"	3.00	.49	.46	.43	.42	.40	.40
Standard Con	Cal.	10.00	3.25	3.50	3.50	3.25	3 25	3.25
Union Con	Nev.	2.50	.30	.72	.25	.25	.23	.21
Utah Con	"	1.00	.11	.10	.09	.09	.09	.09
Yellow Jacket	"	3.00	.30	.27	.24	.23	.24	.24

CALIFORNIA OIL STOCKS.*

Name of Company.	No. of shares.	Par Val.	Mar. 31. H.	Mar. 31. L	Apr. 2. H.	Apr. 2. L	Apr. 3. H.	Apr. 3. L.	Apr 4. H.	Apr 4. L.	Apr 5. H.	Apr. 5. L.	Apr. 6 H.	Apr. 6 L.	Sales
Anaconda	100,000	$5.00	.55	.50	.60	.30	.50	.45	.5	.45	.50	....	.50	.45	2,900
Barker R'nch	200,000	1.00	1.13	....	1.1	....	1.15	....	1.15	....	1.15	....	1.20	1.15	1,165
Blue Goose	5,000	100	20.00	18.00	20 00	17 50	20 00	18.00	20.00	17.50	20 00	....	19.0	17 50	2,
Bucahrn	16,000	10.00	4.00	3 9	4.00	3 90	4.00	3.80	4.00	3 85	4 00	3 90	4.00	3.90	60
Caribou	100,000	1 00	.80	.70	8	.65	.80	.65	75	.65	.70	.6	70	.6	175
Home	100,000	1 00	3 65	3 60	3 68	3.55	3.75	3.60	3 67	3.65	3 65	3.6	3 60	3 55	880
National	100,000	5.00	6 25	....	6 25	....	6 22	....	6 25	....	6.2	....	6 25	....	....
Petroleum	100,000	1.00	.32	....	.35	....	.35	....	.65	....	.35	....	.35	.30	....
San Luis	100,000	10 00	....	....	5.00	....	....	....	5 00	....	....	....	....	....	....
Shamrock	100,000	5 00	.55	....	9	.55	.35	.70	.90	.70	.80	.70	.85	.70	....
Yukon	100,000	2 50	1.35	1.25	1.35	1.25	1.35	1.26	1 50	1.25	1.2	....	1 4	1.30	500

* California and Producers Oil Exchanges. Total sales, 6,210 shares.

BOSTON. MASS.†

Name of Company.	Par val.	No. of shares.	Apr. 19. H.	Apr. 19. L.	Apr. 20. H.	Apr. 20. L.	Apr. 21. H.	Apr. 21. L.	Apr. 23. H.	Apr. 23. L.	Apr. 24 H.	Apr. 24 L.	Apr. 25. H.	Apr. 25. L.	Sales
Adven'u'e.Cons	$25	100,000	....	....	....	....	....	....	5 00	....	5.00	....	....	....	125
Aetna, Cons. g	5	100 000	....	....	2.75	2.50	2 50	....	....	....	....	....	....	....	800
Allouez	25	80,000	....	....	2.50	....	....	....	2.00	1.75	....	....	2.00	....	930
Amal Cop.	100	750,000	....	....	93.50	93 00	94.00	93.63	91.50	90.50	92 50	91.25	91.50	....	1,070
'm. Z. L. & S.	25	60,000	....	....	....	....	....	....	15 00	....	....	....	....	....	10
Anaconda	....	....	....	....	....	....	....	....	45.00	....	....	....	....	....	15
Arcadian, c.	25	150,000	....	....	22.00	21.25	20 00	....	20 00	19 50	20 00	....	....	....	1,085
Arnold, c.	25	60,000	....	....	....	....	6.25	6.00	6.25	6 00	....	....	6 50	....	570
Ashbed	25	40,000	....	....	....	....	.50	....	....	....	....	....	.50	....	200
Atlantic, c.	25	40,000	....	....	....	25 0	24.25	23.00	24.00	25 00	....	....	25.00	....	630
Baltic, c.	25	100,000	....	....	21.0	20 13	23 75	20.00	20.50	20. 0	....	....	20 50	....	1.260
Bingham, c. g.	10	190,000	....	....	10 75	10 50	0.75	....	11.00	10.75	....	....	10 63	10.50	925
Bonanza, Dev.g	10	300,000	....	....	....	....	1.13	....	1 25	....	....	....	....	....	190
Boston & C C.	2	200,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Bos.& Mon.Tr. R	25	150,000	....	....	315	309	306	304	306	296	305	304	307	305	716
British Col.	5	200,000	....	....	....	....	....	....	....	....	11 00	....	....	....	25
Butte & Bost., c	25	200,000	....	....	....	....	3.00	....	71.00	69.00	72.50	71.00	....	....	787
Cal. & Hecla, c.	25	100,000	....	....	750	747	755	750	750	747½	747	745	747	....	47
Catalpa	10	300,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Centennial, c.	10	300,000	....	....	21.5	....	....	....	20 00	19.50	19.75	....	19.06	....	415
Cent'l-Eureka.	25	90,000	....	....	25 50	25.50	....	....	25.50	24 50	24.00	23.00	24 00	23 50	1,120
Central Oil.	25	100,000	....	....	17 50	....	....	....	17.00	....	....	....	16 25	....	220
Cochiti, g.	25	60,050	....	....	11.50	10.38	11.00	....	11 00	....	11 25	10.38	11.00	....	977
Cont.Zl.Mg&Sm	10	157,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Copper Range.	10	110,000	....	....	....	....	21.00	20 50	21.00	....	....	....	....	....	340
Crescent. s.	10	100,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Dominion Coal.	25	10',000	....	....	46.00	45.00	46.50	46 00	45 50	....	45.00	....	45 00	....	1,250
do. pref.	100	150,000	....	....	....	....	....	....	....	....	....	....	116	....	1
Elm River	100	20,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Federal Steel.	12	100,000	....	....	45 00	43 25	43 00	39.50	41 50	40.00	41.50	41.00	42.75	41.75	14,468
do. pref	100	464,843	....	....	72.00	71 50	70.00	69 75	70 0	68.63	70.38	70.00	71 00	....	757
Franklin, c.	25	532,610	....	....	16.00	15.50	....	....	5 50	....	15 5	15.0	15 50	....	245
Gold Coin	25	100,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt	25	40,000	....	....	.87½	....	....	....	....	....	....	....	....	....	....
I. Royal Con. c.	25	100,000	....	....	....	....	27 50	27.00	26 00	25.50	26 00	....	....	....	610
Mass. Con.	25	100 000	....	....	....	....	....	....	....	....	8.00	....	7.88	....	330
Mayflower	25	10 ,000	....	....	....	....	....	....	....	....	3 00	....	....	....	25
Melones	10	167,577	....	....	....	....	....	....	....	....	....	....	....	....	....
Merced. g	15	100,000	....	....	....	....	....	....	6 00	....	....	....	....	....	185
Michigan	25	100,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Mohawk, c.	25	100,000	....	....	....	....	....	....	17.00	16.00	....	....	16.00	....	68
Montana C & C	5	100,000	....	....	8.00	....	....	....	7.80	....	....	....	....	....	805
Napa	7	100,000	....	....	....	....	....	....	....	9.25	....	....	....	....	25
Old Dominion, c	25	150,000	....	....	20.75	20.25	21.00	19.50	21 00	18 00	20.00	19 00	9.50	19.00	257
Osceola, c.	25	93,000	....	....	69 00	....	68 0	....	67 50	66.75	67 0	66 75	....	....	279
Parrot, s & c.	10	229,280	....	....	45.50	45 25	45 75	45.75	44.00	....	44.50	44 0	44.00	....	1,985
Pioneer	10	100,000	....	....	.50	....	50	....	.50	.45	.40	....	.50	.45	1,415
Quincy, c	25	100,000	....	....	139	....	139	....	139	....	139	137	139	....	69
Rhode Island	25	100,000	....	....	....	....	5.00	....	....	....	....	....	....	....	35
Santa Fe, g. c.	10	250,000	....	....	....	....	....	....	5.50	....	....	....	6.00	....	460
San. Ysabel, g.	5	130,000	....	....	....	....	....	....	1.00	....	....	....	1.00	....	5
Tamarack, c.	25	60,000	....	....	....	....	....	....	....	190	....	....	1.90	....	28
Tecumseh	25	80, 00	....	....	....	....	....	....	....	....	....	....	4.50	....	5
Tri Mountain	25	100,000	....	....	9.00	8.63	....	....	8.88	8 2	8.00	....	8.0	....	435
Union C. L	25	80,000	....	....	....	....	....	....	....	....	....	....	3 0	....	10
United States.	....	....	....	....	9.75	8.5	9.25	....	....	....	0 0	9 00	9.00	....	2,370
U. S. Oil	25	100,000	....	....	19.5	....	....	....	19.00	18 00	8.75	18.3	18 00	....	45
Utah Cons,g. c	5	3 0,000	....	....	32 0	31.5	30.50	....	30 50	30.0	31.0	30 00	30.00	29.50	2,170
Victor	5	10 ,000	....	....	1.00	.75	1 00	....	1 00	....	1.00	....	1.00	....	2,170
Victoria	25	100,000	....	....	....	....	....	....	3.00	....	....	....	....	....	50
White Knob	100	50,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Winona, c.	25	10 ,000	....	....	....	....	....	....	....	....	4.00	3.50	....	....	200
Wolverine, c.	25	60,000	....	....	....	....	40.75	40 25	41.00	40 13	40 0	....	40.25	40 13	489
Wyandotte	25	100.0 0	....	....	....	....	....	....	....	....	2 00	....	1 88	....	15

† Official quotations Boston Stock Exchange. Total sales, 44,353.

SALT LAKE CITY, UTAH.

Apr. 21.

Stocks.	Shares	Par val.	Bid.	Asked.	Stocks.	Shares.	Par val.	Bid.	Asked
Ajax	300,000	$10	$0.51	$0.59	Horn Silver	400,000	$25	$1 10	$1 75
Alice	400,000	25	35	.65	Joe Bowers	700,000	1	.06¾	.08
Buckeye	500,000	1	.03	.03½	Joe Bowers Ext.	400,000	½	.01¾	.01¾
Bullion-Beck & Ch.	100,000	10	2.50	3 05	Little Pittsburg	400,000	5	.02¼	.02
Centennial Eureka.	200,00.	25	25.00	26.25	Lower Mammoth	150,000	1	53¾	.56
Chloride Point.	500,000	1	.08½	.11¾	Mammoth	400,000	5	2 25	2.26
Daisy	500,000	3	.60¼	.01¾	May Day	400,000	¾	1 12	1.12¾
Dalton	500,000	5	....	.03¾	Mercur	200,000	25	4 50	4.95
Dalton & Lark	2,500,000	1	.03¾	....	Northern Light	400,000	5	.05	.05¼
Daly	150,000	20	1 50	1.69	Ontario	150,000	100	8.00	8.90
Daly West	150,000	20	19 00	19 12½	Richmond-Am.	500,000	1	.10	.18
Dexter	200,000	5	1 00	1.20	Sacramento	1,000,000	5	2¾	.23¼
Eagle	250, 00	1	.03¼	.04	Silver King	150,000	20	48.50	53.00
Eagle & Blue Bell.	250,000	1	9 ½	.94	Star Consolidat'd	500,000	1	.07¾	.10
Four Aces	250,000	1	.0 ¾	.04	Sunbeam	250,000	1	08	.10
Galena	100,000	10	.15¾	.20	Sunshine	250,000	10	13¾	....
Geyser-Marion	300,000	5	.04¾	....	Swansea	100,000	5	3.78	3.89
Golden Eagle	400,000	1	.01¾	.02¾	South Swansea	150,000	1	1.24	1.24¾
Grand Central	250,000	1	5 50	6 00	Utah	100,000	1	.50	....
Homestake	400,000	1	.03	.09	Valco	200,000	10	.65	.71

TORONTO, ONT.

Name of Company.	Par val.	Apr. 16 B.	Apr. 16 A.	Apr. 17. B.	Apr. 17. A.	Apr. 18. B.	Apr. 18. A.	Apr. 19. B.	Apr. 19. A.	Apr. 20. B.	Apr. 20. A.	Apr. 21. B.	Apr. 21. A	Sales
Ontario:														
Alice A	$1	....	....	.03½	.07	.03½	.06	....	....	.03	.05	.03	.05	1,500
Bullion	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Golden Star	1	....	....	.16¾	.2½	.09½	.11	....	....	.08¾	.10	07¾	08¾	24,375
Ham Reef	1	....	....	.12½	.14	.12	.13¾	....	....	11¾	.13	1 ¾	126	....
Olive	1	....	....	.20	.30	.19	.92	....	....	.20	.30	.20	.30	....
British Col.:														
Athabaska	1	....	....	.25	.28	.24	.28	....	....	.26	.29	.26	.29	....
Big Three	1	....	....	.05	.08¾	.06¾	.08	....	....	.03¾	.07	.05	.07	9,000
Caribou M'K	1	....	....	.93	1.10	.95	1.05	....	....	.87½	1.00	.93	1.01	500
Crow's N. C.	25	35 00	40 00	35.00	38.50	....	....	....	....	35 00	40.00	35.00	38.0	....
Deer Trail	1	....	03¾	.10	.03¾	....	....	....	....	.10	.10¾

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.‡

NAME OF COMPANY.	Par val	Apr. 14. B.	Apr. 14. A.	Apr. 16. B.	Apr. 16. A.	Apr. 17. B.	Apr. 17. A.	Apr. 18. B.	Apr. 18. A.	Apr. 19. B.	Apr. 19. A.	Apr. 20. B.	Apr. 20. A.	Sales.
Acacia	$1	.27½	.27½	.27½	.28	.27½	.28	.27½	.28	.28	.28½	.25½	.29	49,968
Alamo	1	.14½	.16	.15	.15½	.15	.16	.14½	.15½	.....	.15	.15½	.15½	5,000
Am. Con	1	.03¾	.06	.05¾	.06	.05¾	.06	.05¾	.06	.05¾	.05½	.05¾	.06	2,050
Anaconda	1	.36½	.38	.37	.38½	.37	.38	.37	.39	.36½	.39	.37	.39	2,100
Anchor	1	.03½	.03¾	.03½	.03¾	.03½	.03¾	.03½	.03¾	.03½	.03¾	.03¾	.03½	6,000
Anchorial	1	.80	.97	.80	.97	.80	.....	.80	.....	.....	.....	.80	.....	.....
Antelope	1	.02¾	.03	.02¾	.03	.02¾	.03	.02¾	.03	.02¾	.03	.02½	.03	2,000
Aola	1	.05½	.05¾	.05½	.06¾	.05½	.05¾	.05½	.05¾	.05½	.05¾	.05¾	.05¾	28,000
Arcadian	1	.05	.05½	.05	.05¾	.05	.05½	.05	.05¼	.05	.05¼	.04½	.05¾	1,000
Arg'ntum J	1	.20¾	.02½	.20¾	.21¼	.19	.21	.....	.20	.20¾	.....	.20	.20¾	2,100
Banner	1	.....	.01¾	.....	.04¾	.04	.04¾	.03¾	.04¼	.....	.04¾	.....	.....	4,000
Battle Mt.C.	1	.29¼	.30	.29	.30	.29	.29¾	.29	.29¾	.29¾	.30	.29	.30	4,500
Ben Hur	1	.06¾	.07	.....	.07¼	.06	.07¼	.....	.07½	.....	.07¾	.06½	.06¾	4,500
Black Bell	1	.....	.13	.....	.13	.....	.12	.....	.12	.10	.11¾	.10¾	.11¼	.....
Blue Bell	1	.12¾	.12¾	.12¼	.12¾	.12	.12¼	.12	.12¼	.12	.12¾	.12¼	.12¾	1,000
Bob Lee	1	.06¾	.14¾	.06¼	.06¾	.06	.06½	.06	.06½	.05¾	.06	.05½	.06	.....
Buckhorn	1	.06	.06¾	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾	7,000
Cadillac	1	.01¾	.02	.01¾	.02½	.01¾	.02½	.02	.02½	.01¾	.02½	.01¾	.02½	.....
Central C'n	1	.06¼	.06¾	.05¾	.....	.06¼	.06¾	.....	.....	.06¾	.....	.06¼	.06¾	.....
Champion	1	.07½	.08	.07¾	.....	.07¾	.08	.07¾	.07¾	.07¾	.07¾	.07¼	.07¾	3,000
Chicolo	1	.03	.03¼	.03¼	.03¾	.03¼	.03¾	.03	.03¼	.03	.03¼	.03	.03¼	1,500
C.K.&N	1	.02½	.02¾	.02¾	.03	.02¼	.02¾	.02½	.02¾	.02½	.02¾	.0 ¾	.02¾	5,000
C.C.Col'bia	1	.07¾	.08	.08	.08¾	.06¾	.08	.07¾	.08	.07¾	.08	.07¾	.08	12,000
C.O G. Ext.	1	.08¼	.09¼	.08½	.09	.07	.09	.08	.08½	.07¾	.09	.07¾	.08¼	3,000
C.C. & Man.	1	.11½	.11¾	.11¾	.11¾	.10¾	.11	.11	.11¼	.11¾	.11¾	.10¾	.11	33 000
Copper Mt.	1	.04¾	.04¾	.04¾	.04¾	.04¼	.04¾	.04¼	.04¾	.04¼	.04¾	.04¼	.04½	11,000
Creede&CC	1	.14¾	.15	.14¾	.15	.14¾	.15	.14	.15	.14¾	.15	.14¾	.15	4,000
C. C. Con	1	.13¾	.13¾	.13¾	.13¾	.13¾	.13¾	.14	.13¾	.13¾	.13¾	.13¾	.13¾	40,500
Dante	1	.14½	.14¾	.14¾	.14¾	.14	.14¾	.14½	.14¾	.14½	.14¾	.14½	.14¾	20,500
Des Moines	1	.06¾	.06¾	.06¾	.06¾	.06¾	.06¾	.06¾	.06¾	.06¼	.06¾	.06¼	.06½	13,000
Eclipse	1	.08	.08½	.08	.08¾	.07¾	.08¼	.08	.08¼	.08	.08¼	.08	.....	1,000
ElktonCon	1	1.25¾	1.26¼	1.25¾	1.25¾	1.25	1.25¾	1.23½	1.24	1 26¼	1.27	1.21½	1.28	50,265
El Paso G	1	.39¼	.....	.39¾	.40¼	.39¼	.40	.39¼	.40	.....	.....	.....	.....	4,000
Enterprise	1	.20	.45	.20¼	.21¾	.20¾	.22	.20¾	.....	.20	.....	.21¾	.21¾	1,500
F.Rawlings	1	.40¼	.43	.42¾	.43	.41	.43	.43	.....	.43¾	.44	.43½	.45	9,700
Favorite	1	.01¾	.02	.....	.....	.....	.....	.....	.....	.01¾	.02½	.02½	.....	44,500
Findley	1	.16¾	.17	.16¾	.17	.16½	.16¾	.16¼	.16¾	.16½	.16¾	.16	.16½	44,500
Garf. Con	1	.17	.20	.17	.20	.....	.20½	.17	.20	.18	.20	.18	.20	5,000
Golden Fl	1	.32	.36	.32	.45	.....	.....	.32	.42	.32	.42	.33	.42	.....
Gold Hill	1	.02¾	.03¼	.02¾	.03	.02¾	.03	.02¾	.03	.02¾	.03¼	.02¾	.03¼	1,000
Gold.Sov'n	1	.10½	.10¾	.10	.10½	.09¾	.09¾	.09¾	.09¾	.09¾	.09¾	.09¾	.09¾	67,000
Hayden	1	.01¾	.02	.01¼	.02	.02	.02¼	.02	.02¼	.02	.....	.02	.02½	7,000
Ida May	1	.30¾	.27	.27½	.27¾	.26½	.27¼	.26	.27	.26	.27	.26¾	.27	8,500
Indep'ndce	1	.72	.73¾	.7 ¾	.73¾	71	.75	.74	.74¾	.73¾	.73¾	.73¾	.74	16,200
Ing. Con	½	.23¾	.24½	.23¾	.24	.23¾	.23¾	.22	.23¾	.23¾	.24	.23¾	.24	65,000
Isabella	1	1.15	1.15¾	1.17¾	1.18	1 24	1.20¾	1.17½	1.17¾	1 19¾	1.20	1 21	1.22	51,080
Jack Pot	1	.60	.61	.60¾	.61¾	.61	.....	.61	.....	.60	.....	.60	.....	3,100
Joseshine	1	.02¼	.02¾	.02	.02¾	.02	.02¾	.02	.02¼	.02½	.02	.02	.02¼	4,000
Key West	1	.04½	.04¾	.04¼	.04¾	.04¼	.04½	.04½	.04¾	.04¼	.04¾	.04¼	.04¾	6,000
Lexington	1	.15¼	.15¾	.15½	.15¾	15	.15¼	.14¾	.15	.14¾	.15	.14¾	.14¾	56,000
Magnet R	1	.03¾	.03½	.03¾	.03¾	.03¾	.03¾	.....	.03¾	.03¾	.03¾	.03¾	.03¾	7,000
Margaret	1	.....	.03¾	.03	.....	.03¼	.03	.....	.03¼	.03	.03¾	.03¼	.03¾	9,000
Margery	1	.04½	.05	.04¾	.05	.05	.05½	.05	.0 ¾	.04	.04¾	.04¾	.05	34,500
Matoa	1	.25½	.....	.....	.....	.25	.26½	.25	.26	.2 ½	.....	.25	.....	8 500
Midway	1	.06½	.06¾	.06½	.06¾	.06½	.06¾	.06½	.06¾	.06½	.06¾	.06½	.06¾	7,0
M. J. T	1	.03¾	.....	.01¾	.04	.03¾	.04	.03½	.04	.03¾	.04¼	.03¾	.04¾	14 0 0
Mobile	1	.03¼	.03½	.03¼	.03¾	.03¼	.03¾	.03¼	.03¾	.03¼	.03¾	.03¼	.03½	2,000
Moll.Dwye	1	.03¼	.03¾	.03½	.03¾	.03¼	.03¾	.03½	.03¾	.03¾	.03¾	.03½	.03¾	18,000
Mollie Gib	1	.....	.....	.23¾	.....	.22½	.....	.24¼	.25	.23	.25	.....	.....	2,000
Monarch	1	.07½	.....	.07¾	.07¼	.07¼	.07¼	.07½	.07¼	.07¾	.07¾	.07½	.07¾	18,000
Montreal	1	.05¾	.05¾	.05½	.07	.05¼	.07	.05¾	.....	.05¾	.....	.06¼	.07	1,000
Moon-A'c'r	1	.66½	.....	.68	.75	.65	.75	.68½	.71	.68	.70	.68	.....	1,500
Morning S	1	.03¼	.04	.03¾	.04¼	.03¾	.04¼	.03¼	.04¼	.03¾	.04	.03¾	.04	12,000
Mtn.Beauty	1	.09½	.09¾	.09¾	.09¾	.09½	.09¾	.09	.09¾	.09¼	.09¾	.09½	.09¾	11,500
Mt Rosa	1	.75	.85	.76	.80	.76	.8	.76½	.8	.77	.80	.80	.....	4,500
National	1	.08½	.08¾	.08¾	.08¾	.08¾	.08¾	.08¼	.05¾	.05	.08¼	.08¼	.03¼	30,000
Nellie V	1	.11¾	.1 ¾	.12¼	.12¾	.11¾	.12¼	.11¾	.11¾	.11	.11¾	.11	.12¼	30,000
New Haven	1	.08¾	.08¾	.08¼	.08¾	.08¼	.08¾	.08¼	.09	.08¼	.08¾	.08¼	.08¾	25 000
OliveB'nch.	1	.07	.07¾	.07¾	.07¾	.07¾	.07¾	.07¾	.07¾	.07¾	.07¾	.07¾	.07¾	8,000
Oriole	1	.....	.....	.....	.....	04	.04¾	.04½	.05	.04½	.04¾	.04½	.04¾	4, 00
Orphan	1	.....	.22	.20	.22	.20	.22	.20½	.21¾	.21	.21¼	.20	.21¼	1,000
Pelican	1	.02¾	.03	.02¾	.03	.02¾	.03	.....	.03	.02¾	.03	.02¾	.03	3,500
Pharmacist	1	.12½	.....	.12½	.12¾	.12½	.12¾	.11¾	.12	.11¾	.12	.11¾	.11¾	40,50
Pilgrim	1	.12¾	.13½	.12¾	.13¼	.12¾	.13¼	.14¾	.18	.12¾	.13	.12¾	.13	5,100
Pinnacle	1	.19	.20	.19	.19¾	.19	.19¾	.18¼	.19	.18¾	.18¾	.18½	.19	7,000
Portland	1	2.38½	2.40	2.39	.....	2.39	.....	2 40	2.50	2.48¾	2.49	.....	2.49	8,900
Prince Alb.	1	.....	.....	.04¼	.04¾	.04¼	.04¾	.04½	.04¾	.04½	.04¾	.04¼	.04¾	16,000
Princess	1	.....	.03¼	.....	.04¼	.....	.04¾	.05¾	.06½	.....	.06½	.....	.06¾	7,000
Progress	1	.07¼	.08	.07¼	.08¼	.07¼	.08¼	.07	.07¼	.06¾	.07¾	.....	.07½	6,000
Pythias	1	.05½	.....	.05¾	.06	.05¾	.06	.05¾	.....	.05¾	.06	.0588	.07	2,000
Raven	1	.67	.68	.65	.66	.65	.66	.62	.66	.64	.65	.67½	.68	16,300
Republic	1	.06½	.03½	.06	.06¾	.06	.06¾	.06¼	.06¾	.06¼	.06¾	.06¾	.06¼	19,000
Rob't Burns	1	.04¼	.05	.04¼	.05	.0488	.05	.0488	.05	.04¾	.05	.04¾	.05¼	9,000
Rose Maud	1	.10¾	.10¾	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾	.10¼	.1088	25,000
Rose Nicol	1	.12¾	.12¾	.12¼	.12¾	.12¼	.12¾	.12¼	.12¾	.12¾	.14	.13¼	.....	7,500
Sliver Gold	1	.01¾	.01¾	.01¼	.01¾	.01¼	.01¾	.01¼	.0 ¾	.01¼	.01¾	.01¼	.01¾	3,000
Specimen	1	.....	.10¾	.10¾	.10¾	.10¾	.10¾	.10½	.10¾	.10¾	.11	.10¾	.10¼	53,500
Tornado	1	.48¼	.50	.....	.49¾	.....	.49¾	.45	.49	.45	.45	.46	.46¾	9,100
Touraine	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trachyte	1	.06¾	.07¼	.0688	.07¼	.06	.07¼	.06¾	.....	.06¾	.....	.06¾	.....	.....
Uncle Sam	1	.....	.05¼	.03	.....	.04¾	.....	.04¾	.05¼	.04	.05¼	.....	.05¾	1,000
Union	1	.....	.....	.45	.48	.45	.49	.45	.49	.45½	.49	.46	.48	4,800
Vindicator	1	1.56	1.58	1.50	1 57	.....	1.58	1.54	1 58	1.53	1.56	1.50	1.56	1,60
Work	1	.31	.31¾	.31½	.31¾	.31¾	.31¾	.31¾	.32¾	.32¼	.32¾	.33½	.35¾	18,20
Zenobia	1	.15	.17	15	.15¾	.....	.15¾	.....	.18	.14	.17	.14	.18	2,00

Colorado Springs Mining Stock Exchange. Total sales, 1,162 833 shares. *Ex-dividend.

MONTREAL, CANADA.*

NAME OF COMPANY.	Par Val	Week, Apr. 24. H.	L.	Sales.	NAME OF COMPANY.	Par Val	Week, Apr. 24. H.	L.	Sales.
Big Three	$1	.08	.06¾	24,340	Monte Christo	$1	.05	.03½	2,000
California	1	.11	.09¾	12400	Montreal G. F	1	.06	.03	2,550
Can. Gold Fields	0.10	.08	.05½	5,500	Montreal-London	....	0.24	.31	.20¾	7,400
Decca	1	.09	.07	7,500	Okanogon	1	.02¾	.02	5,500
Deer Trail Con	1	.10¾	.09	59,900	Payne	1	1.24½	1.15	9,000
Giant	1	.....	.....	.....	Rambler-Cariboo	1	.31½	.16	.....
Golden Star	1	.15¾	.05	6,500	Republic Con	1	1.12	1.01	3,300
Gold Hills Dev	1	.05	.02	.....	Slocan-Sovereign	1	.31	.20	400
Knob Hill	1	.75	.50	.....	Virtue	1	1.14¾	.06	25,100
Majestic	1	.....	.....	.....					

*Montreal Stock Exchange. Total sales, 156,400 shares.

MEXICO.

Apr. 14.

NAME OF COMPANY.	No. of shares.	Last div'd.	Prices. Op'g.	Prices. Cl'g.	NAME OF COMPANY.	No. of shares.	Last div'd	Prices. Op'g.	Prices. Cl'g.
Durango:					Hidalgo:				
Barradon y Cab	2,400	.....	$40	$40	Real del Monte	2,554	10.00	506	500
Cantidaria de Pan	1,200	.....	20	20	San Francisco Hc	6,000	3.00	195	170
Capuzaya Guan	2,400	.....	15	30	Soledad	960	5.00	330	280
Restauradora	10,000	.....	10	20	Sorpresa	960	7.50	260	300
Guanajuato:					Union Hacienda	2,000	5.00	300	290
Angustias	2,400	5.00	220	280	Mexico:				
Cinco Senores y An	2,000	15.00	355	360	Coronas	500	.....	75	75
Guadalupe Hacie'a	10,000	2.00	200	210	Esperanza y An	3,000	10.00	1,500	1,480
Trinidad, aviadora	2,000	.....	6	15	Michoacan				
do. aviada	400	.....	15	10	Lux de Borda ava	4,000	.....	22	18
Zona Minera de Pos	2,400	.....	6	8	S. Luis Potosi:				
Hidalgo:					Concep. y An	2,400	.....	210	235
Amistad y Concord	9,600	1.47	22	23	Zacatecas:				
Arevalo	720	.....	200	200	Asturiana y An	2,500	10.00	175	170
Bartolome de Med	2,000	2.00	65	70	Cabezon	2,400	.....	15	15
Carmen	1,100	7.75	250	200	C'delar. de Pinos	2,500	.....	240	230
Lus Ca Maravillas	800	.....	120	100	Palma de Somb	2,400	.....	50	40
Pabellon	800	27.89	30	20					

DENVER, COLO.‡

NAME OF COMPANY.	Par val.	Apr. 14. B.	Apr. 14. A.	Apr. 16. B.	Apr. 16. A.	Apr. 17. B.	Apr. 17. A.	Apr. 18. B.	Apr. 18. A.	Apr. 19. B.	Apr. 19. A.	Apr. 20 B.	Apr. 20 A.	Sales.
Acacia	1	.27½	.28	.27½	.28½	.....	.....	.....	.....	.28	.28½	.27¾	.28	.28½	.....	3,000
Anaconda	1	.....	.....	.36	.....	.36	.....	.....	.....	.36½	.39	.35½	.38	.....	.....	1,200
Antelope	2	.02¾	.....	.02¾	.....	.....	.....	.....	.....	.02½	.03¼	.02¾	.03	.02¾	.027	2,020
Aola	1	.....	.....	.05¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arg. J	1	.20	.20¾	.20¾	.....	.19	.21	.19¾	.21½	.....	.21¾	.....	.....	.....	.....	.....
Bankers	1	.20	.....	.20¾	.....	.....	.....	.....	.....	.20	.21	.20¾	.20¾	.20	.....	.....
C. C. Bull'n	1	.02	.02½	.02	.02¾	.02	.02¾	.....	.....	.....	.....	.....	.....	.....	.2½	4,000
C. C. & M	1	.11	11¾	.11¾	.11¾	.11¾	.....	.....	.....	.....	.....	.11	.....	.10¾	.....	2,000
Cr. & C. C	1	.14¾	.....	.....	.....	.....	.....	.14¾	.....	.....	.....	.14¾	.....	.14¼	.....	.....
Dictator	1	.02¾	.03	.02¾	.....	.....	.02¾	.03½	.02¾	.02¾	.03¼	.02¾	.03¼	.027	.....	.....
El Paso	1	.....	.....	.....	.....	.....	.....	.40	.40¼	.....	.....	.02	.....	.....	.....	1,000
Favorite	1	.01¾	.02	.01¾	.02¼	.....	.....	.....	.....	.....	.....	.02	.....	.02	.....	1,000
Finance	1	.001	.002	.00¾	.002¾	.001	.002	.....	.....	.....	.....	.....	.....	.001	002	5,000
Indepen'ce	1	.73¾	.....	.73	.75	.....	.....	.....	.....	.74¾	.75	.74	.74¾	.74	.75	500
Ing Con	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.23½	.....	.237	.....	.....
Ironclad	1	.04¾	.05	.....	.....	.....	.....	.04¼	.....	.04½	.....	.04¾	.....	.04¾	.....	.....
Isabella	1	1.19¼	.....	1.15½	.....	1.17½	1.18	1.18	1.18¾	1	1.18	.....	1.20¾	1.22	.....	500
Lexington	1	.15	.15¼	.15½	.15¾	.15	.15¼	.14¾	.15½	.14¾	.15	.11¾	.....	.....	.....	2,000
New Haven	1	.08¾	087	.08¾	.067	.06¾	.08¾	.08¾	.....	.08¾	.08¾	.08¾	.08¾	.08¾	.08¾	4,000
New Zeal'd	1	.41	.....	.41	.....	.....	.41	.50	.41¾	.50	.41	.....	.41	.....	.....	200
Old Gold	1	.017	.02	.....	.02	.017¾	.02	.....	.....	.02	.017	.02½	.....	.....	.....	1,000
Ophir	1	.56	.....	.53½	.59	.53	.59¼	.59	.50¾	.65	.70	.65	.67	500	.....	.....
Union	1	.47¾	.477	.43	.49	.45	.50	.45	.48	.46	.49	.45	.48	.....	.....	.....
Work	1	31¼	.31¾	.31	.31¼	.31	.33	.31¾	.....	.....	.....	.....	.....	.33	.....	.....

‡ Official Quotations Denver Stock Exchange. Total sales, 27,900 shares.

PARIS.

Apr. 5.

NAME OF COMPANY.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Op'ning	Prices. Closing.
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs	27,000,000	2,000	75.00	1,998.00	1,995.00
" " Firminy	"	" "	3,000,000	500	125.00	3,790.00	3,790.00
" " Fives-Lille	"	" "	12,000,000	500	35.00	560 00	557.00
" " Huta-Bank	Russia	Iron & steel	.....	500	.....	4,980.00	4,9 0.00
" " la Marine	France	Steel mfrs	20,000,000	500	50.00	1,895 00	1,880.00
Anzin	"	Coal	.....	500	220.00	6,990.00	6,975.00
Boleo	Lower Cal	Copper	.....	500	1.07	3,110.00	3,180.00
Briansk	Russia	Coal & Iron	.....	500	.....	1,334.50	1,330.00
Champ d'Or	S. Africa	Gold	5,375,000	25	3.75	36.25	.....
Courrieres	France	Coal	600,000	300	70.00	3,100.00	3,070.00
Dombrowa	Russia	Coal	.....	500	12.50	1,115.00	1,105.00
Donets	"	Steel	.....	.....	.....	1,200.00	1,180.00
Dynamite Centrale	France	Explosives	.....	500	20.00	4.7.00	470.00
Escombrera-Bleyberg	Spain	Lead	.....	500	35.00	1,320.00	1,315.00
Fraser River	Brit. Col'mb	Gold	250.000	25	.....	8.00	10.00
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	142.00	165.50
Laurium	Greece	Zinc & lead	16,800,000	500	30.00	623.00	605.00
Maldidan	Mexico	Zinc	12,500,000	500	50.00	1,382.00	1,350.00
Metaux, Cie. Fran. de	France	Metal d'lers	25,000,000	500	30.00	522 50	508.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	40.00	1,220.00	1,225.00
Napthe Baku	Russia	Petroleum	.....	.....	.....	818.00	820.00
Napthe, Le	"	"	.....	.....	.....	1,300.00	1,310.00
Napthe Nobel	"	"	.....	.....	.....	698.75	687.50
" parts	"	"	.....	.....	.....	13,975.00	13,775.00
Nickel	N.Caled'nia	Nickel	10.000.000	250	10.00	525.00	525.00
Penarroya	Spain	Coal, etc	.....	500	65.00	2,795 00	2,820.00
Rsbecca	Colo'do, U.S.	Gold	5,000,000	25	.....	5.00	4.75
Salines de l'Est	France	Salt	.....	500	6.50	220.00	215.00
Salines du Midi	France	" etc	.....	500	25.00	1,095.00	1,070.00
Vielle Montagne	Belgium	Zinc	9,000,000	80	36.00	830.00	849.00

LONDON.

Apr. 12.

NAME OF COMPANY.	Country.	Author-ised capital.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations. Buyers	Quotations. Sellers.
				£ s. d.	s.d.	£ s. d.	£ s. d.
Alaska Goldfields	Alaska	$300,000	1 0 0	3 1	Mar., 1899	18 9	1 1 3
Alaska-Mexican, g	"	200,000	1 0 0	4.8	May, 1900	12 6	17 6
Alaska-Treadwell, g	"	1,000,000	5 0 0	1 6	"	4 15 0	5 0 0
Anaconda, c., s	Montana	4,000,000	5 0 0	8 2	Apr., 1900	10 12 6	10 17 6
Chiapas, g., s., c	Mexico	252,500	1 0 0	.....	.....	5 0	7 0
De Lamar, g., s	Idaho	400,000	1 0 0	6	May, 1899	2 6	5 0
Elkhorn Priority (New), s	Colorado	87,500	1 0 0	2 0	June, 1898	1 3	3 9
Golden Gate, g	California	90,000	1 0 0	.....	.....	1 0	2 0
Grand Central, g., s	Mexico	300,000	1 0 0	2 0	Jan., 1900	15 0	1 1 3
Hall Mines, c., s	British Col	300,000	1 0 0	1 0	May, 1899	1 6	2 0
Le Roi, g	" "	1,000,000	5 0 0	5 0	Nov., 1899	5 15 0	5 17 6
Lillie, g	Colorado	250,000	1 0 0	2½	Apr., 1900	15 0	1 0 0
Montana, g., s	Montana	660,000	1 0 0	6	Apr., 1899	3 6	4 6
Newfoundland, c	Newfoundland	250,000	1 0 0	.....	.....	5 0	10 0
Palmarejo & Mexican, g., s	Mexico	100,000	1 0 0	.....	.....	1 0	2 0
Rio Tinto, c	Colorado	1,100,000	1 0 0	2 0	Mar., 1900	2 16 3	2 18 9
Copiapo, c	Chile	200,000	2 0 0	4 0	Dec., 1899	4 5 0	4 10 0
Frontino & Bolivia, g	Colombia	140,000	1 0 0	1 6	Oct., 1899	1 13 9	1 16 3
St. John del Rey, g	Brazil	600,000	1 0 0	1 0	Dec., 1899	1 7 6	1 10 0
UtahCon., g (High'ndBoy)	Utah	300,000	1 0 0	rts.	Mar., 1898	7 2 6	7 7 6
Velvet, g	BritishCol'mbia	100,000	1 0 0	.....	.....	1 0 0	1 2 6
Ymir, g	"	200,000	1 0 0	1 0	Nov., 1899	1 10 0	1 12 6
British Am. Corp	"	1,500,000	1 0 0	2 0	Mar., 1900	15 0	16 0
Linares, l	Spain	45,000	3 0 0	15 0	Mar., 1900	9 0 0	10 0 0
Mason & Barry, c., sul	Portugal	420,000	2 0 0	10 0	Apr., 1900	4 15 0	5 0 0
§Rio Tinto, c	Spain	1,625,000	5 0 0	1 15	Nov., 1899	59 10 0	59 15 0
" pref	"	1,625,000	5 0 0	2 6	"	6 5 0	6 10 0
§Tharsis, c	"	1,450,000	2 0 0	15 0	Apr., 1900	10 2 6	10 5 0
Assoc. Gold Mines	W. Australia	500,000	1 0 0	1 6	Jan., 1900	5 2 6	5 7 6
Broken Hill Prop., s	N.S. Wales	384,000	8 0	1 0	Apr., 1900	2 7 6	2 8 9
Great Boulder Prop	W. Australia	175,000	2 0	6	Apr., 1900	1 13 6	1 14 6
Hannan's Brownhill, g	"	140,000	1 0 0	7 6	May, 1900	10 50	10 10 0
§Ivanhoe Gold Corp	"	1,000,000	5 0 0	5 0	Jan., 1900	14 2 6	14 7 6
Kalgurlie, g	"	120,000	1 0 0	rts.	Oct., 1899	7 15 0	8 0 0
Lake View Consols, g	"	250,000	1 0 0	10 0	Feb., 1900	14 2 6	14 7 6
*Mt. Lyell M. & R., l, c	Tasmania	900,000	3 0 0	5 0	Mar., 1900	9 12 6	9 17 6
*Mt. Morgan, g	Queensland	1,000,000	1 0 0	7	Apr., 1900	5 0 0	5 5 0
Waihi, g	New Zealand	320,000	1 0 0	2 6	Apr., 1900	9 12 6	9 17 6
Champion Reef, g	Colar Fields	220,000	10 0	4 0	May, 1900	6 2 6	6 7 6
Mysore Gold, g	"	250,000	10 0	5 6	Mar., 1900	6 2 6	6 5 0
Nundydroog, g	"	242,000	1 0 0	2 6	Mar., 1900	3 10 0	3 12 6
§Ooregam, g	"	145,000	1 0 0	1 6	Dec., 1899	4 0 0	4 2 6
" pref. g	"	120,000	1 0 0	1 6	"	5 0

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Author-ized Capital Stock.	Shares Issu'd No.	Par Val	Dividends. Paid, 1900.	Total to Date.	Latest. Date.	Amt.
1	Acacia, g.	Colo.	$1,500,000	1,500,000	$1	.....	.....	.....	.....
2	Ætna Con., q.	Cal.	500,000	100,000	5	$30,000	$225,000	April. 1900	.15
3	Alabama Coal & Iron, pf	Ala.	2,500,000	25,000	100	43,750	43,750	Feb. 1900	1.75
4	Alamo, g.	Colo.	1,000,000	1,000,000	1	.....	.....	.....	.....
5	Alaska-Mexican, g.	Alask	1,000,000	180,000	5	18,000	447,031	Jan. 1900	.10
6	Alaska-Treadwell, g.	Alask	5,000,000	200,000	25	75,000	4,295,000	Jan. 1900	.37½
7	Alice, g. s.	Mont.	10,000,000	400,000	25	.....	1,075,000	April. 1898	.05
8	Alliance, g.	Colo.	500,000	450,000	1	.....	31,500	Dec. 1899	.07
9	Amalgamated, c.	Mont.	75,000,000	750,000	100	3,000,000	4,500,000	April. 1900	2.00
10	Amazon, g.	Colo.	600,000	600,000	1	42,000	62,000	Mar. 1900	.05
11	American Coal	Md.	1,500,000	60,000	25	75,000	802,500	Mar. 1900	1.25
12	American Gold, g. s. c. l.	Colo.	3,000,000	300,000	10	.....	446,000	Dec. 1899	.04
13	Amer. Sm. & Ref., pref.	U. S.	32,500,000	325,000	100	1,263,925	1,832,675	April. 1900	2.14
14	Am. Steel & Wire, pf.	U. S.	40,000,000	400,000	100	1,400,000	4,200,000	April. 1900	1.75
15	Am. Steel & Wire, com.	U. S.	50,000,000	500,000	100	875,000	875,000	April. 1900	1.75
16	American Zinc	Kas.	500,000	5,000	100	15,000	35,000	Mar. 1900	1.00
17	Am. Zinc, Lead & Sm.	Mo.	2,500,000	60,000	25	60,000	180,000	Jan. 9001	1.00
18	Anaconda Copper	Mont.	30,000,000	1,200,000	25	2,400,000	14,550,000	April. 1900	2.00
19	Anchoria-Leland, g.	Colo.	600,000	600,000	1	.....	198,000	April. 1899	.03
20	Anglo-Mexican, g.	Mex.	2,001,625	400,230	5	.....	1,728,993	Dec. 1898	.24
21	Apollo Con., g.	Alask	1,000,000	100,000	10	70,000	210,000	Jan. 1900	.07
22	Appie Ellen, g.	Colo.	600,000	600,000	1	.....	25,000	Aug. 1898	.01
23	April Fool	Nev.	500,000	500,000	1	.....	16,000	Oct. 1899	.01
24	Argentum-Juniata, g.	Colo.	1,300,000	650,000	2	.....	156,000	Oct. 1895	.03
25	Argonaut	Cal.	2,000,000	200,000	10	50,000	470,000	Mar. 1900	.05
26	Arizona Copper	Ariz.	3,190,550	.....	...	421,153	1,309,572	Mar. 1900	1.32
27	Associated, g.	Colo.	1,250,000	1,250,000	1	.....	84,000	Feb. 1899	.01
28	Atlantic, c.	Mich.	1,000,000	40,000	25	80,000	860,000	Feb. 1900	2.00
29	Aurora, l.	Mich.	2,500,000	100,000	25	.....	890,000	June. 1899	.50
30	Bald Butte	Mont.	250,000	250,000	1	.....	769,648	Dec. 1899	.03
31	Bankers, g.	Colo.	1,250,000	1,250,000	1	.....	.....	.....	.....
32	Bankok Cora Belle, s.	Colo.	600,000	600,000	1	.....	106,000	July. 1896	.01
33	Battle Mtn. Con., g.	Colo.	2,500,000	2,500,000	1	.....	.....	.....	.....
34	Big Four, g.	Colo.	1,000,000	1,000,000	1	.....	.....	.....	.....
35	Big Seven, g.	Cal	100,000	100,000	1	.....	6,000	April 1898	.03
36	Big Six, g. s.	Colo.	500,000	500,000	1	.....	15,000	May. 1898	.00½
37	Boston-Aurora, pref.	Mo.	800,000	32,000	25	15,840	44,880	Mar. 1900	.17
38	Boston & California.	Cal.	600,000	600,000	1	.....	72,000	June. 1899	.06
39	Boston & Colo. Smelting	Colo.	750,000	15,000	50	11,250	281,250	Jan. 1900	.75
40	Boston Duenweg, z.	Mo.	1,000,000	40,000	10	12,000	44,000	Mar. 1900	.10
41	Boston Get There, z.	Mo.	250,000	22,500	10	6,750	18,000	Mar. 1900	.10
42	Boston-Little Circle, z.	Mo-K.	1,000,000	100,000	10	30,000	110,000	Mar. 1900	.10
43	Boston & Mont. Con.	Mont.	3,750,000	150,000	25	1,200,000	15,700,000	Feb. 1900	8.00
44	Boston Providence, z.	Mo.	150,000	15,000	10	2,250	9,750	Mar. 1900	.05
45	Boston, q.	Cal.	1,000,000	100,000	10	10,000	20,000	Jan. 1900	.10
46	Boston Sunflower, z.	Mo.	150,000	15,000	10	.....	4,500	Oct. 1899	.30
47	Breece, i.	Colo.	5,000,000	200,000	25	10,000	80,000	Feb. 1900	.05
48	Buffalo Hump	Idaho	1,000,000	1,000,000	1	20,000	20,000	April. 1900	.01
49	Bullion-Beck & Champ.	Utah.	1,000,000	100,000	10	30,000	2,468,400	Mar. 1900	.10
50	Bunker Hill & Sullivan.	Idaho	3,000,000	300,000	10	63,000	864,090	Mar. 1900	.07
51	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	2,000,000	68,850,000	Mar. 1900	20.00
52	Cambria Steel.	Pa.	16,000,000	320,000	50	160,000	1,280,000	Feb. 1900	.50
53	Cariboo-McKinney, g.	B.Col	800,000	800,000	1	.....	311,965	June. 1899	.01½
54	Centen'l-Eureka, g.s.l.c.	Utah.	5,000,000	100,000	25	17,700	2,167,700	Mar. 1900	.59
55	Central Lead, l.	Mo.	1,000,000	10,000	100	15,000	157,000	Mar. 1900	.50
56	Champion, g. s.	Cal.	340,000	34,000	10	.....	321,700	Nov. 1899	.25
57	Charleston, p. r.	S. C.	1,000,000	10,000	100	.....	200,000	June. 1899	2.00
58	Colonial, l.	Mo.	1,000,000	1,000,000	1	.....	10,000	Aug. 1899	.01
59	Colorado Smelting	Mont.	1,000,000	100,000	10	.....	1,945,000	Jan. 1899	1.00
60	Commodore	Colo.	1,200,000	1,200,000	1	.....	432,000	Jan. 1899	.04
61	Commonwealth, z., pref.	Mo.	500,000	100,000	5	15,000	35,000	Mar. 1900	.05
62	Consolidated Gold Mines	Colo.	1,000,000	1,000,000	1	20,000	30,000	Mar. 1900	.01
63	Consolidation Coal	Md.	10,250,000	102,500	100	205,000	5,921,650	Feb. 1900	2.00
64	Cons. Zinc & Lead, pf.	Mo.	400,000	400,000	1	8,000	8,000	Jan. 1900	.20
65	Continental, z.	Mo.	1,500,000	150,000	10	.....	.....	.....	.....
66	Cordell, z. l.	Mo.	300,000	60,000	5	6,000	6,000	Mar. 1900	.05
67	Cripple Creek Con.	Colo.	2,000,000	2,000,000	1	160,000	160,000	Mar. 1900	.08
68	Crossus, g.	Cal.	1,000,000	190,000	5	11,400	60,400	Mar. 1899	.06
69	Crowned King, g. s.	Ariz	6,000,000	600,000	10	.....	242,760	May. 1899	.02
70	Dalton & Lark, g.s.l.	Utah.	2,500,000	2,500,000	1	.....	87,500	Mar. 1896	.00½
71	Daly	Utah.	3,000,000	150,000	20	.....	2,925,000	Mar. 1897	.25
72	Daly West	Utah.	3,000,000	150,000	20	150,000	270,000	Mar. 1900	.25
73	Damon, g.	Colo.	2,000,000	2,000,000	1	.....	.....	.....	.....
74	Deadwood-Terra, g.	S. D.	5,000,000	200,000	25	.....	1,350,000	May. 1898	.15
75	Deer Trail Con.	Wash	3,000,000	3,000,000	1	.....	55,000	Dec. 1899	.00½
76	De Lamar, g. s.	Idaho	2,000,000	400,000	5	.....	2,346,000	May. 1899	.12
77	Della S., g.	Colo.	1,000,000	1,000,000	1	.....	60,000	Jan. 1897	.01
78	Delta, l. z.	Mo.	100,000	100,000	1	2,685	6,785	Mar. 1900	.01
79	Doe Run, l.	Mo.	500,000	5,000	100	7,500	97,500	Mar. 1900	.50
80	Dutch, g.	Cal.	1,500,000	130,000	10	.....	39,000	Feb. 1898	.05
81	Eldorado, g.	Cal.	1,000,000	100,000	10	.....	10,000	July. 1899	.10
82	Elkhorn, New, s. l.	Colo.	437,500	87,500	5	.....	1,325,000	June. 1898	.48
83	Elkton Con., g.	Colo.	1,250,000	1,125,000	1	33,750	754,461	Mar. 1900	.03
84	El Paso, g. s.	Colo.	650,000	650,000	1	.....	12,393	Jan. 1898	.01
85	Empire State-Idaho.	Idaho	1,000,000	98,514	10	88,662	406,700	Mar. 1900	.30
86	Enterprise, s. l.	Colo.	500,000	500,000	1	.....	900,000	Sept. 1898	.05
87	Fanny Rawlings, g. s.	Colo.	1,000,000	1,000,000	1	.....	20,000	Aug. 1899	.01
88	Federal Steel, pf.	U. S.	100000,000	532,610	100	3,195,660	4,793,520	April. 1900	3.00
89	Federal Steel, com.	U. S.	100000,000	464,843	100	1,743,161	1,743,161	Mar. 1900	2.50
90	Fern, g.	B.Col	200,000	200,000	1	.....	10,000	Jan. 1898	.05
91	Ferris-Haggarty, c.g.s.	Wyo.	1,000,000	1,000,000	1	.....	5,000	Feb. 1899	.00½
92	Findley, g.	Colo.	1,250,000	1,250,000	1	.....	.....	.....	.....
93	Florence, s.	Mont.	2,500,000	400,000	5	.....	230,000	Dec. 1899	.05
94	Frisco Con., l. s.	Idaho	2,500,000	500,000	5	.....	920,000	Nov. 1899	.25
95	Galena, s. l. g.	Utah.	1,000,000	100,000	10	.....	71,000	Sept. 1897	.05
96	Garfield Con., g.	Colo.	1,200,000	1,200,000	1	.....	34,000	May. 1899	.01
97	Geyser-Marion, g.	Utah.	1,500,000	300,000	5	.....	96,000	Sept. 1898	.02
98	Gold Coin of Victor, g.	Colo.	1,000,000	1,000,000	1	60,000	420,000	Mar. 1900	.02
99	Gold & Globe, g.	Colo.	750,000	750,000	1	.....	51,625	July. 1898	.00½
100	Gold King, g.	Colo.	1,000,000	1,000,000	1	30,000	120,000	Jan. 1900	.03
101	Gold Sovereign, g.	Colo.	3,000,000	3,000,000	1	.....	.....	.....	.....
102	Golden Cycle, g.	Colo.	1,000,000	200,000	5	30,000	288,500	Mar. 1900	.05
103	Golden Eagle, g.	Colo.	500,000	500,000	1	.....	20,000	Nov. 1899	.01
104	Golden Fleece, g. s.	Colo.	600,000	600,000	1	.....	569,480	Feb. 1897	.01
105	Golden Reward, g.	S. D.	1,000,000	100,000	10	.....	155,000	Feb. 1898	.15
106	Golden Star, g.	Ont.	1,200,000	1,200,000	1	.....	45,500	July. 1899	.00½
107	Gould, g.	Colo.	1,000,000	1,000,000	1	.....	.....	.....	.....
108	Grafton, g.	Colo.	1,000,000	1,000,000	1	.....	10,000	Oct. 1899	.01
109	Grand Central, g.	Utah.	250,000	250,000	1	.....	666,250	Sept. 1899	.24
110	Grand Gulch	Ariz.	250,000	240,000	1	4,800	4,800	Feb. 1900	.01
111	Grass Valley Expl	Cal.	100,000	30,000	2	22,500	52,500	Mar. 1900	.25
112	Gwin, g.	Cal.	1,000,000	20,000	50	15,000	116,500	Mar. 1900	.25
113	Hall Mines, Ltd.	B. Col	1,500,000	250,000	5	.....	120,000	May. 1899	.24
114	Hecla Con.	Mont	1,500,000	30,000	50	.....	2,190,000	Dec. 1898	.50
115	Hidden Treasure, g.	Cal.	500,000	360,000	1	.....	3,600	July. 1899	.01
116	Holy Terror, g.	S. D.	500,000	500,000	1	.....	167,000	Dec. 1899	.01
117	Homestake, g.	S. D.	21,000,000	210,000	100	315,000	8,458,750	Mar. 1900	.50
118	Horn-Silver, g. s. c. sp. l.	Utah.	10,000,000	400,000	25	.....	5,250,000	Mar. 1899	.05
119	Ida May, g.	Colo.	500,000	500,000	1	.....	.....	.....	.....
120	Idaho, s. l.	B.Col	500,000	500,000	1	.....	292,000	Jan. 1899	.05
121	Independence Town & M	Colo.	1,250,000	1,250,000	1	25,000	37,500	April. 1900	.01
122	International, z.	Mo.	$1,000,000	1,000,000	$1	$15,000	$15,000	April. 1900	.01
123	Iowa, g. s. l.	Colo.	1,666,667	1,666,667	1	7,500	97,500	Jan. 1900	.00¾
124	Iron Mountain, g. s. l. i.	Mont.	5,000,000	500,000	10	.....	507,500	April. 1898	.02
125	Iron Silver, s. l.	Colo.	10,000,000	500,000	20	.....	2,500,000	April. 1899	.20
126	Isabella, g.	Colo.	2,250,000	2,250,000	1	67,500	607,500	Mar. 1900	.03
127	Jack Pot, g.	Colo.	1,250,000	1,250,000	1	.....	175,000	Dec. 1899	.06
128	Jamison	Cal.	3,900,000	390,000	10	.....	50,700	April. 1899	.10
129	Keystone, g.	Colo.	1,500,000	1,500,000	1	.....	.....	.....	.....
130	Klondike Bonanza, Ltd.	Klond	750,000	52,750	5	.....	12,000	Aug. 1899	.24
131	Lake Superior Iron.	Mich.	2,100,000	84,000	25	.....	2,132,000	Feb. 1899	1.00
132	Last Chance, s. l.	B. Col	500,000	500,000	1	.....	45,000	Apr. 1899	.05
133	Last Dollar, g.	Colo.	1,500,000	1,500,000	1	30,000	60,000	Feb. 1900	.02
134	Le Roi, g.	B. Col	5,000,000	200,000	5	.....	1,305,000	Nov. 1899	1.20
135	Lexington, g.	Colo.	1,500,000	1,500,000	1	.....	.....	.....	.....
136	Lillie, g.	Colo.	1,250,000	250,000	5	33,750	335,360	Mar. 1900	.05
137	Little Tiger, g.	Cal.	500,000	500,000	1	15,000	47,500	Feb. 1900	.01½
138	Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	40,000	1,650,000	Jan. 1900	.10
139	Marion Con.	Colo.	5,000,000	500,000	10	.....	300,000	May. 1899	.01
140	Mary McKinney, g.	Colo.	1,000,000	1,000,000	1	30,000	60,000	Jan. 1900	.03
141	Maryland Coal, pf.	Md.	1,885,005	18,850	100	.....	546,619	Dec. 1899	3.00
142	Matoa, g.	Colo.	1,000,000	1,000,000	1	.....	25,000	Dec. 1898	.02½
143	Mercur, g.	Utah.	5,000,000	200,000	25	50,000	1,416,000	Jan. 1900	.25
144	Minnesota Iron.	Minn.	16,500,000	165,000	100	.....	4,735,000	Oct. 1898	1.50
145	Missouri Zinc Fields, pf.	Mo.	400,000	16,000	25	7,930	29,242	Mar. 1900	.16
146	Modoc, g. s.	Colo.	500,000	500,000	1	15,000	160,000	Mar. 1900	.01
147	Mollie Gibson, s. l.	Colo.	5,000,000	1,000,000	5	.....	4,080,000	Jan. 1895	.05
148	Monarch, g.	Colo.	1,000,000	1,000,000	1	120,000	120,000	April. 1900	.12
149	Montana, Ltd., g. s.	Mont.	3,300,000	657,128	5	.....	453,700	April. 1899	.12
150	Montana Ore Purchas'g.	Mont.	2,500,000	80,000	25	80,000	1,440,000	Feb. 1900	1.00
151	Montreal, g.	Colo.	1,000,000	1,000,000	1	.....	.....	.....	.....
152	Monument, g.	Colo.	300,000	300,000	1	.....	18,124	Nov. 1899	.01
153	Moon-Anchor Con., g.	Colo.	1,750,000	600,000	1	.....	261,000	Nov. 1898	.07½
154	Moose, g.	Colo.	600,000	600,000	1	.....	186,000	Feb. 1896	.01
155	Morning Star Drift, g.	Cal.	240,000	2,400	100	.....	847,200	Nov. 1899	10.00
156	Morse, g.	Colo.	1,250,000	1,250,000	1	.....	213,150	May. 1899	.12
157	Mountain Beauty, g.	Colo.	2,000,000	2,000,000	1	.....	.....	.....	.....
158	Mt. Rosa, g.	Colo.	1,000,000	1,000,000	1	.....	75,000	Dec. 1899	.04
159	Mt. Shasta.	Cal.	100,000	20,000	5	.....	6,000	May. 1899	.30
160	Moulton	Mont.	2,000,000	400,000	5	.....	500,000	Oct. 1899	.05
161	Mountain Copper.	Cal.	6,250,000	250,000	25	.....	1,173,750	Oct. 1899	2.16
162	Napa Con., q.	Cal.	700,000	100,000	7	40,000	1,080,000	April. 1900	.20
163	National Lead, com.	U. S.	15,000,000	149,054	100	149,054	1,341,486	Mar. 1900	1.00
164	National Lead, pf.	U. S.	15,000,000	149,040	100	260,820	8,607,060	Mar. 1900	1.75
165	National Salt, pf.	U. S.	5,000,000	24,000	100	42,000	126,000	Jan. 1900	1.75
166	National Steel, pf.	U. S.	27,000,000	270,000	100	.....	1,890,000	Dec. 1899	1.75
167	New Central Coal.	Md.	1,000,000	50,000	20	20,000	490,000	April. 1900	.40
168	New Idria, q.	Cal.	500,000	100,000	5	40,000	210,000	April. 1900	.20
169	New York Zinc.	Mo.	700,000	28,000	25	21,000	42,000	Mar. 1900	.25
170	N.Y.& Hon Rosario, s.g.	C. A.	1,500,000	150,000	10	45,000	1,205,000	Mar. 1900	.10
171	North Star Mines of N.J.	Cal.	5,000,000	250,000	10	.....	50,000	Nov. 1899	.20
172	Nugget.	Colo.	1,000,000	1,000,000	1	.....	35,000	Aug. 1898	.00½
173	Okanogan, g.	Wash	62,500	1,250,000	05	.....	3,125	Oct. 1899	.00¼
174	Ontario, s. l.	Utah.	15,000,000	150,000	100	45,000	13,617,500	Jan. 1900	.30
175	Ophir, g.	Colo.	700,000	700,000	1	.....	.....	.....	.....
176	Orphan Belle, g.	Colo.	1,000,000	1,000,000	1	.....	197,899	Dec. 1899	.09
177	Original Empire, g.	Cal.	5,000,000	50,000	100	.....	500,000	May. 1899	1.00
178	Osceola, c.	Mich.	2,500,000	93,000	25	.....	3,080,500	Dec. 1899	3.00
179	Pacific Coast Borax.	Cal.	2,000,000	20,000	100	100,000	522,500	Dec. 1900	5.00
180	Parrot, c.	Mont.	2,300,000	230,000	10	345,000	3,380,898	Jan. 1900	1.50
181	Pennsylvania Coal.	Pa.	5,000,000	100,000	50	.....	4,050,000	May. 1899	8.00
182	Pennsylvania Con.	Cal.	5,150,000	51,500	100	15,450	151,625	Mar. 1900	.10
183	Pennsylvania Steel, pf.	Pa.	1,500,000	15,000	100	26,250	52,500	Jan. 1900	1.75
184	Petro, g.	Utah.	1,000,000	200,000	5	.....	32,000	Oct. 1899	.02½
185	Pharmacist Con., g.	Colo.	1,500,000	1,500,000	1	.....	84,000	Jan. 1898	.01
186	Pioneer, g.	Cal.	1,000,000	100,000	10	.....	62,500	Mar. 1899	.12½
187	Pittsburg Coal, pf.	Pa.	32,000,000	308,000	100	539,000	539,000	Jan. 1900	1.75
188	Plumas Eureka, g.	Cal.	1,406,250	140,625	10	.....	2,713,169	Oct. 1896	.12
189	Portland, g.	Colo.	3,000,000	3,000,000	1	210,000	2,767,080	Mar. 1900	.02
190	Princess, g.	Colo.	1,000,000	1,000,000	1	.....	40,000	May. 1896	.01
191	Prince Albert, g.	Colo.	3,000,000	3,000,000	1	.....	.....	.....	.....
192	Queen Bess Propr., s. l.	B.Col	500,000	100,000	5	.....	25,000	July. 1898	.12½
193	Quicksilver, pref.	Cal.	4,300,000	43,000	100	.....	1,845,411	May. 1899	.50
194	Quincy, c.	Mich.	2,500,000	100,000	25	500,000	11,570,000	Feb. 1900	5.00
195	Rambler—Cariboo, s. l.	B.Col	1,000,000	1,000,000	1	.....	60,000	Dec. 1899	.01
196	Raven, g.	Colo.	1,500,000	1,000,000	1	30,000	99,500	Mar. 1900	.01
197	Reco, s. l.	B.Col	1,000,000	1,000,000	1	.....	297,500	Jan. 1898	.10
198	Republic Con., g.	Wash	3,500,000	3,500,000	1	105,000	382,500	Mar. 1900	.01
199	Republic Iron & Steel, pf	U. S.	25,000,000	212,570	100	371,997	1,215,992	April. 1900	1.75
200	Reward, g.	Cal.	1,000,000	100,000	10	.....	20,000	Aug. 1899	.20
201	Russell-Irwin, z.	Mo.	250,000	25,000	10	.....	15,000	Oct. 1899	.10
202	Sacramento, g.	Utah.	5,000,000	1,000,000	5	.....	138,000	Oct. 1899	.00½
203	St. Joseph, l.	Mo.	3,000,000	300,000	10	37,500	2,934,500	Mar. 1900	.50
204	Seventy-Six, g. s.	Colo.	1,000,000	200,000	5	.....	2,950	Mar. 1898	.01
205	Santa Rosalia, g.s.	Cal.	100,000	100,000	1	.....	130,000	Oct. 1899	.05
206	Silver King, g. s. l.	Utah.	3,000,000	150,000	20	225,000	2,675,000	Mar. 1900	.50
207	Small Hopes, s.	Colo.	5,000,000	250,000	20	.....	3,325,000	Feb. 1899	.10
208	Smuggler, s. l. z.	Colo.	1,000,000	1,000,000	1	90,000	1,300,000	Mar. 1900	.03
209	South Eureka, g.	Cal.	1,500,000	300,000	5	.....	12,000	May. 1898	.04
210	South Swansea, s. l.	Utah.	150,000	150,000	1	.....	165,000	Oct. 1899	.05
211	Specimen, g.	Colo.	1,200,000	1,200,000	1	.....	.....	.....	.....
212	Squaw Mountain, g.	Colo.	2,000,000	2,000,000	1	.....	10,000	Nov. 1899	.00½
213	Standard Con., g. s.	Cal.	2,000,000	200,000	10	20,000	3,919,226	Feb. 1900	.10
214	Standard.	Idaho	500,000	500,000	1	.....	1,745,000	April. 1899	.06
215	Stratton's Independ'ce.	Colo.	5,500,000	1,000,000	5	480,000	1,440,000	Feb. 1900	.48
216	Strong, g.	Colo.	2,500,000	2,500,000	1	75,000	925,000	Mar. 1900	.01
217	Swansea, s. l.	Utah.	500,000	100,000	5	20,000	221,500	Mar. 1900	.05
218	Tamarack, c.	Mich.	1,500,000	60,000	25	.....	6,270,000	Dec. 1899	6.00
219	Temonj, g.	Colo.	1,000,000	1,000,000	1	.....	.....	.....	.....
220	Tomboy, g.	Colo.	1,500,000	300,000	5	.....	812,000	Dec. 1899	.24
221	Tornado, g.	Colo.	1,000,000	1,000,000	1	.....	.....	.....	.....
222	Union, g.	Colo.	1,250,000	1,250,000	1	.....	82,744	June. 1896	.01
223	Union Leasing.	Colo.	1,000,000	1,000,000	1	.....	336,000	July. 1895	.04
224	United, z. l., pref.	Mo.	1,000,000	40,000	25	20,000	60,000	Jan. 1900	.50
225	United Verde, c.	Ariz.	3,000,000	300,000	10	450,000	1,312,500	Mar. 1900	.50
226	Utah.	Utah.	1,000,000	100,000	10	.....	179,000	Jan. 1899	.02
227	Victor, g.	Colo.	1,000,000	200,000	5	.....	1,155,000	Dec. 1898	.50
228	Vindicator, Con., g.	Colo.	1,500,000	1,065,000	1	53,250	357,750	Jan. 1900	.05
229	War Eagle Con.	B.C.	2,000,000	1,750,000	1	52,500	545,250	Feb. 1900	.01½
230	West. Mine Enterprise.	Mont.	500,000	120,000	1	.....	48,680	Jan. 1898	.20
231	What Cheer, z.	Mo.	225,000	22,500	10	4,500	9,000	Feb. 1900	.20
232	Wolverine, c.	Mich.	1,500,000	60,000	25	120,000	390,000	April. 1900	2.00
233	Work, g.	Colo.	1,500,000	1,500,000	1	.....	.....	.....	.....
234	Yellow Aster, g.	Cal.	1,000,000	100,000	10	60,000	383,789	Mar. 1900	.20
235	Ymir, g.	B.Col	1,000,000	125,000	5	.....	30,000	Nov. 1899	.24
236			.....	.....	.....	.....	.....	.....	.....

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. This table is corrected up to March 24. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

	Cust. Meas.	Price.
Abrasives—		
Carborundum, f.o.b. Niagara Falls, Powd., F. FF. FFF	lb.	$0.10
Minute No. 1	"	.15
No. 15	"	1.00
Corundum, N. C.	"	.07@.10
Chester, Mass.	"	.04½@.05
Emery, Turkish flour	"	.03
Grains	"	.05
Naxos flour	"	.03
Grains	"	.05
Chester flour	"	.03
Grains	"	.05
Peekskill flour	"	.01¾
Grains	"	.02½
Crude, Kuluk, best	lg. ton	18.50
Levant, "	"	22.00
Naxos (Greek) best	"	26.00
Pumice Stone, Am. powd.	lb.	.01¾@.02
Italian, powdered	"	.01½
Lump, per quality	"	.04@.40
Rottenstone, ground	"	.02½@.03
Lump, per quality	"	.05@.14
Rouge, per quality	"	.12@.30
Acids—Acetic, 30% pure	100 lbs.	3.50
30% ch. pure	"	6.00
80% pure	"	7.50
Benzoic, English	oz.	.12½
German	lb.	.46
Boracic, crvst	"	.10
Powdered	"	.10½
Carbolic, crude, 60%	gal.	.28
Cryst. 37%	lb.	.36
Liquid, 95%	gal.	.40
Carbonic, liquid	lb.	.12½
Chromic, crude	"	.20
Chem. pure	"	.50
Absol. ch. pure	"	1.75
Hydrochloric, ch. pure	"	.07
Hydrofluoric, 36%	"	.03
48%	"	.05
Best	"	.25
Nitric, chem. pure	"	.09
Sulphuric, 98%	"	.01½
Chem. pure	"	.07
Tartaric, cryst	"	.32
Powder	"	.32½
Alcohol—Grain	gal.	2.40
Refined wood, 95@97%	"	.90@.95
Purified	"	1.20
Alum—Lump	100 lbs.	1.75
Ground	"	1.85
Chrome, com'l	"	2.75@3.00
Aluminum—Nitrate	lb.	1.50
Oxide, com'l, common	"	.06½
Best	"	.20
Pure	"	.80
Hydrated	"	.05
Sulphate, pure	"	1.50
Com'l	"	.01¼
Ammonia—Aqua, 16°	"	.03¼
18°	"	.03½
20°	"	.04
26°	"	.05¾
Ammonium—		
Bromide, pure	"	.52@.53
Carbonate lump	"	.08¼@.08¾
Powdered	"	.09¼@.09¾
Muriate, gran.	"	.06½
Lump	"	09¾
Nitrate, white, pure (99%)	"	.10¼
Phosphate, com'l	"	.12
Chem. pure	"	60
Antimony—		
Glass	"	.30@.40
Needle, lump	"	.05½@.06
Powdered, ordinary	"	.05¾
Best	"	.08¼
Oxide, com'l white, 95%	"	.09½
Com'l white, 99%	"	.12
Com'l gray	"	.07
Sulphuret, com'l	"	.16
Arsenic—White	"	4.70@4.75
Red	"	.07¾@.08
Asphaltum—		
Ventura, Cal.	sh ton	32.00
Cuban	lb.	.01¼@.03¼
Egyptian, crude	"	.05¼@.06
Trinidad, refined	lg. ton	30.00@35.00
San Valentino	lg. ton	15.00
Seyssel (French) mastic	sh.ton	21.00
Gilsonite, Utah, ordinary	lb.	.03
Select	"	.03¾
Barrum—Carbonate, Lump, 80@90%	sh. ton	25.00@27.50
92@98%	"	26.00@29.00
Powdered, 80@90%	lb.	.01¾@.02
Chloride, com'l	"	.02@.02¼
Chem. pure cryst	"	.05
Nitrate, powdered	"	.06
Oxide, com'l, hyd.cryst	"	.18
Hydrated, pure cryst.	"	.25
Pure, powd.	"	.27
Sulphate	"	.01
Barytes—Am. Cr., No. 1	sh.ton	9.00
Crude, No. 2	"	8.00
Crude, No. 3	"	7.75
Am. Floated	"	14.50@17.50
German, gray	"	14.50
Snow white	"	17.50
Bauxite—Ga. mines: 1st grade	lg. ton.	5.00@5.16
Second grade	"	4.00@4.50
Ala., f.o.b., 1st grade	"	5.00
Second grade	"	3.85
Bismuth—Oxide, hydr.	lb	2.25@2.30
Subnitrate	"	1.30@1.35
Bitumen, "B"	"	.03¼
"A"	"	.05
"A" and "B"	"	.04½
Bone Ash	"	.02¾@.03½
Borax—Cryst. and pow'd	"	.07¼@.07½
Bromine—Bulk	"	.45
Cadmium—Metallic	"	1.40
Acetate, pure white	100 lbs.	1.00
Sulphate	"	2.00@2.50

	Cust. Meas.	Price.
Calcium—		
Acetate, gray	100 lbs.	$1.55
" brown	"	1.10
Carbide, ton lots, f. o. b. Niagara Falls, N.Y.	sh. ton	75.00
Carbonate, ppt.	lb.	.05
Chloride, com'l	100 lbs.	.95
Best	"	1.90
Sulphite	lb.	.05
Cement—		
Portland, Am., 400 lbs.	bbl.	1.50@2.00
Belgium	"	1.95@2.20
English	"	2.45@2.55
German	"	2.30@2.70
"Rosendale," 300 lbs.	"	1.10
Sand cement, 400 lbs.	"	1.55@1.95
Slag cement, imported	"	1.65
Ceresine—		
Orange and Yellow	lb.	.12
White	"	.14
Chalk—Lump, bulk	sh. ton	2.15
Precipitated	lb.	.05
French	"	.03
Chlorine—Liquid	"	.28
Water	"	.15
Chrome Ore—		
(50% chrome) ex ship	lg. ton	20.00@20.50
Sand	"	35.00
Bricks, f.o.b., Pittsburg	M	175.00
Clay, China—Am. com., ex-dock, N. Y.	lg ton	8.00
Am. best, ex-dock, N. Y.	"	9.00
English, common	"	12 00
Best grade	"	17 00
Slip Clay	sh. ton.	5.00
Coal Tar Pitch	gal.	.08
Cobalt—Carbonate	lb.	1.50
Nitrate	"	1.30
Oxide—Black	"	2.00
Gray	"	2.50
Smalt, blue ordinary	"	.20
Best	"	.30
Chem. pure	"	5.00
Copperas	100 lbs.	.72½
Copper—Carbonate	lb.	.18
Chloride	"	.25
Nitrate, crystals	"	.35
Oxide, com'l	"	.19
Cream of Tartar—Crys.	"	.22½
Granulated	"	.22½
Powdered	"	.23½
Cryolite	"	.06½
Explosives—		
Blasting powder, A. 25 lb.	keg	2.50
Blasting powder, B.	"	1.25
"Rackarock," A	lb.	.25
"Rackarock," B	"	.18
Judson R.R. powder	"	.10
Dynamite (20% nitro-glycerine)	"	.13
(30% nitro-glycerine)	"	.14
(40% nitro-glycerine)	"	.15
(50% nitro-glycerine)	"	.17
(60% nitro-glycerine)	"	.19
(75% nitro-glycerine)	"	.22
Glycerine for nitro (32 2-10° Be.)	"	.13¼@.13½
Feldspar—Ground	sh. ton	8.00@9.00
Flint—(See Silica).		
Fluorspar—		
Am. lump, 1st grade	"	12.90
2d grade	"	12.40
Gravel & crushed, 1st g	"	11.90
2d grade	"	11.00
Ground, 1st grade	"	16.40
Foreign, lump	"	8.30@12.00
Ground	"	11.50@14.00
Fuller's Earth—Lump	100 lbs.	.75
Powdered	"	.85
Refined lump	"	1.25
Ganister Rock	lg. ton.	6.50
Gypsum—Ground	sh. ton	8.00@8.50
Fertilizer	"	7.00
Rock	lg. ton	4.00
English and French	"	14.00@16.00
Infusorial Earth—Ground.		
American, best	"	20.60
French	"	37.50
German	"	40.00
Iodine—		
Crude	100 lbs.	2.45
Resublimed	"	2.85
Iron—		
Muriate	lb.	.05
Nitrate, com'l	"	.01
True	"	.02¾
Oxide, pure copperas col	"	.05@.10
Purple-brown	"	.02
Venetian red	"	.01@.01½
Scale	"	.01@.03
Kaolin—(See Clay, China).		
Kryolith—(See Cryolite.)		
Lead—		
Acetate, white	lb.	.07
Com'l, broken	"	.06¼
Brown	"	.05½
Nitrate, com'l	"	.06½
" gran.	"	.8½
Lime—Bldg., ab. 250 lbs	bbl.	.90
Finishing	"	1.00
Magnesite—		
Crude, lump (95%) Greece	lg. ton	7.00@7.50
Calcined (Greece)	sh. ton	16.50
Bricks (Greece)	M.	170.00
Bricks, Am., f.o.b., Pittsburg	M.	175.00
Magnesium—		
Carbonate, light, fine pd	lb.	.03¾
Blocks	"	.06@.09
Chloride, com'l	"	.01¾
Fused	"	.20
Nitrate	"	.60
Manganese—Crude, pow'd 70@75% binoxide	"	.01¼@.01½
Crude, pow'd 75@85% binoxide	"	.01½@.02½
85@90% binoxide	"	.02½@.03¼

	Cust. Meas.	Price.
Manganese—		
Crude-pow'd 90@95% binoxide	lb.	.02¾@.05¼
Carbonate	"	.16@.20
Chloride	"	.04
Ore, 50% Foreign	unit	.24@.24½
Domestic	"	.30
Marble—Flour	sh. ton	5.50@6.00
Mercury—		
Bichloride	lb.	.74
Mica—N. Y. gr'nd, coarse	"	.04@.05
Fine	"	.06@.06½
Sheets, 1½x3 in.	"	.60
8x10 in.	"	13.00
Mineral Wool—		
Slag, ordinary	100 lbs.	.90
Selected	"	1.40
Extra	"	3.00
Rock, ordinary	sh. ton	32.00
Selected	"	40.00
Extra	"	50.00
Monazite—92%	"	140.00
Nickel—Oxide, No. 1	lb.	1.00
No. 2	"	.60
Sulphate	"	.13@.13½
Oils—Black, reduced 29 gr.: 25@30 cold test	gal.	.11@.11½
15. cold test	"	.12@.12½
Zero	"	.13@.14
Summer	"	.10½@.11
Cylinder, dark steam ref	"	.10@.15
Dark filtered	"	.13@.18
Light filtered	"	.16@.19
Extra cold test	"	.23@.28
Gasolene, 86° @ 90°	"	.16@.21
Naphtha, crude 68@72°	"	10.65
"Stove"	"	.13
Linseed, domestic raw	"	.62@.63
Boiled	"	.61@.65
Calcutta, raw	"	.71
Graphite, lubricating, Am. dry	lb.	.10
In oil	"	.12
Axle grease	"	.08¼@.10
Wood grease	"	.05@.06
Ozokerite—Foreign	"	.09
Paints and Colors—		
Benzine, Sumatra	"	.35@.40
Marbled	"	.27
Chrome green, common	"	.05
Extra	"	.10@.12
Yellow, common	"	.10
Best	"	.25
Silica Graphite, thick	"	.12
Thinned	gal.	1.15
Lampblack, com'l	lb.	.03
Refined	"	.08
Calcined	"	.12@.20
Fine spirit	"	.20@.35
Litharge, Am. powd.	"	.06½
English flake	"	.09½
Glassmakers, Foreign	"	.06½
Metallic, brown	sh. ton	16.00@19.50
Red	"	16.00
Ocher, Am. common	"	9.25@10.00
Best	"	21.25@25.00
Dutch, washed	lb.	.04¾
French, washed	"	.01¾@.02½
Orange mineral, Am.	"	.08¾@.08½
Foreign, as to make	"	.09½@.11¼
Paris green, pure, bulk	"	.12½@.13
Red lead, American	"	.06½
Foreign	"	.08¾
Shellac, "D. C."	"	.27
Native	"	.14½
Turpentine, spirits	gal.	.56½
Ultramarine, best	lb.	.22
Vermilion, Amer. lead	"	.14
Quicksilver	"	.69
Chinese	"	.85
English, imported	"	.71
White lead, Am., dry	"	.05¾
In oil	"	.06½
English	"	.06½@.08¾
Whiting, common	100 lbs.	.40
Gilders	"	.54
Zinc white, Am., ex. dry	lb.	.04¾@.05¼
American, red seal	"	.07¼@.07¾
Green seal	"	.07¾@.08
Foreign, red seal, dry	"	.06¼@.08¼
Green seal, dry	"	.06¾@.08⅜
Foreign, in oil	"	.10½@.11¾
Plumbago—		
Am. lump, f. o. b. Providence, R. I.	sh. ton	8.00
Am. pulv., f. o. b. Providence, R. I.	"	30.00
German, lump	lb.	.01¼
Pulverized	"	.02
Ceylon, pulv. common	"	.04
Best	"	.06@.08
Italian, pulv	"	.01¼
Potash—		
Caustic, ord.	"	.06@.06¼
Elect. (90%)	"	.06½
Potassium—		
Bicarbonate cryst	"	.08½
Powdered or gran	"	.12
Bichromate	"	.09
Bromide	"	.46
Carbonate, 96@98%	"	.05½
Com'l	"	.03½
Chromate	"	.35
Cyanide (98@99%)	"	.28@.29
Iodide, bulk	"	2.30
Permanganate, pure cr.	"	.14
Prussiate, yellow	"	.18½@.19
Red	"	.37
Silicate	"	.06
Sulphide, com'l	"	.10
Quartz—(See Silica).		
Rosin—		
Com. strained (280 lbs.)	bbl.	1.70
Best strained	"	3.50
Medium	"	2.00
Salt—		
N.Y. com. fine	sh. ton	2.00

	Cust. Meas.	Price.
Salt—N. Y. agricultural	sh. ton	$1.50
Saltpeter—Crude	100 lbs.	3.55@3.62½
Refined	"	4.50
Samarskite	lb.	1.00
Silica—Best foreign	lg. ton	10.00@11.00
Ground quartz, ord	sh. ton	6.00@8.00
Best	"	12.00@13.00
Lump quartz	"	2.50@4.00
Glass sand	"	2.75
Fire bricks (Blue Welch)	M.	35.00
Silver—Chloride	oz.	.65
Nitrate	"	.40
Oxide	"	.85@1.10
Slate—Ground	sh. ton	7.50@8.75
Sodium—Acetate, com'l	lb.	.04¾
Bichromate	"	.06¾@.06¾
Bromide	"	.50
Chlorate, com'l	"	.10
Hyposulphite	100 lbs.	1.70@1.80
Nitrite, 96@98%	lb.	.08
Peroxide	"	.45
Phosphate	"	.02¾
Prussiate	"	.14½
Triphosphate	"	.04
Silicate, conc	"	.05¼
com'l	"	.02¼
Sulphate, gran., puri'd	"	.03
Sulphide	"	.01¾
Sulphite	"	.02½
Tungstate, com'l	"	.35
Pure	"	.50
Strontium—Nitrate	"	.08
Sulphur—Roll	100 lbs.	1.75
Flour	"	1.85
Flowers, sublimed	"	2.05
Talc—N. C., 1st grade	sh. ton	13.75
N. Y., Fibrous	"	8.00@9.00
French	lg. ton	16.00
Italian	100 lbs.	1.50@2.00
Tin—Bichloride	lb.	.09¼@.10
Crystals	"	.22¼
Muriate, 36°	"	.09
Muriate, 52°	"	.15
Oxide, white, ch. pure	"	.41
Uranium—Oxide	"	1.80@3.00
Zinc—Metallic, ch. pure	"	.09
Carbonate	"	.15
Chloride	"	.05¼
Dust	"	.07¼
Sulphate	"	.02@.02⅜

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

	Cust. Meas.	Price.
Barium—Amalgam	grm.	$1.19
Electrol	"	5 71
Beryllium—Powder	"	5.95
Crystals	"	9.04
Nitrate (N Y.)	lb.	32.00
Boron—Amorphous, pure	grm.	.19
Crystals, pure	"	1.43
Nitrate (N. Y.)	lb.	1.50
Cadmium	kg.	1.90
Calcium	grm.	4.28@5.95
Cerium—Fused	grm.	1.02
Nitrate (N. Y.)	lb.	17.00
Chromium—Fused, Elect.	kg.	5.95
Pure powder 95%	"	1.79
Chem. pure cryst	grm.	.26
Cobalt—(98@99%)	kg.	6.31@7.85
Pure	"	30.94
Didymium—Nitrate (N.Y.)	lb.	60.00
Erbium	grm.	3.09
Nitrate (N. Y.)	lb.	62.00
Germanium—Powder	grm.	33.32
Fused	"	35.70
Glucinum—Powder	"	5.95
Crystals	"	9.04
Nitrate (N. Y.)	oz.	2.50
Indium	grm.	4.05
Iridium	"	1.43
Lanthanum—Powder	"	4.28
Electrol, in globules	"	9.04
Nitrate (N. Y.)	lb.	57.00
Lithium	grm.	2.38
Nitrate (N. Y.)	oz.	.60
Magnesium—In bars	kg.	6.19
In wire	"	9.99
Powdered	"	5.71@6.90
Molybdenum—Fused	grm.	.20
Powder, 95%	kg.	2.62
Niobium	grm.	3.81
Osmium	"	.95
Palladium—Wire	"	.95
Sponge	"	71
Potassium—In balls	kg.	17.85
Rhodium	grm.	2.62
Rubidium—Pure	"	4.76
Ruthenium—Powder	"	2.38
Rutile—Crude	kg.	.43
Selenium—Com'l powder	"	33.32
Sublimed powder	"	42.84
Sticks	"	35.70
Silicium—Com'l	"	28.56
Pure crystals	"	59.50
Sodium (N. Y.)	lb.	.75
Strontium—Electrol	grm.	6.19
Tantalium—Pure	"	3.57
Tellurium—Ch. p. sticks	kg.	119.00
Powder	"	95.20
Thallium	"	26.18
Thorium—Metallic	grm.	7.85
Nitrate 49@50% (N. Y.)	lb.	4.75
Titanium	kg.	47.60
Uranium	"	190.40
Nitrate (N. Y.)	oz.	.25
Vanadium—Fused	grm.	1.19
Wolfram—Fused, elect	kg.	238.00
Powder, 95@98%	"	1.67
Purest, powder	"	6.43
Yttrium	grm.	3 33
Nitrate (N. Y.)	lb.	62.00
Zirconium—Com'l	kg.	119.00
Nitrate (N. Y.)	lb.	9.00

Note.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to April 16. Readers of the Engineering and Mining Journal are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.